2000-01 AUTOMATIC TRANSMISSIONS

Servicing - "S" & "T" Series

APPLICATION

TRANSMISSION APPLICATION

Application	Transmission Model (RPO Code)
Chevrolet	
Blazer	4L60E (M30)
S10 Pickup	4L60E (M30)
GMC	
Jimmy	4L60E (M30)
Sonoma Pickup	4L60E (M30)
Oldsmobile Bravada	4L60E (M30)

TRANSFER CASE APPLICATION

Application	Transfer Case Model
Chevrolet	
Blazer	(1) NV 233 (NP1) Or NV 236
S10 Pickup	(1) NV 233 (NP1) Or NV 236
GMC	
Jimmy	(1) NV 233 (NP1) Or NV 236
Sonoma Pickup	(1) NV 233 (NP1) Or NV 236
Oldsmobile Bravada	NV 136 (NP1)
(1) NVG 233 is selectable, and NVG 236 is automatic.	

IDENTIFICATION

OIL PAN GASKET

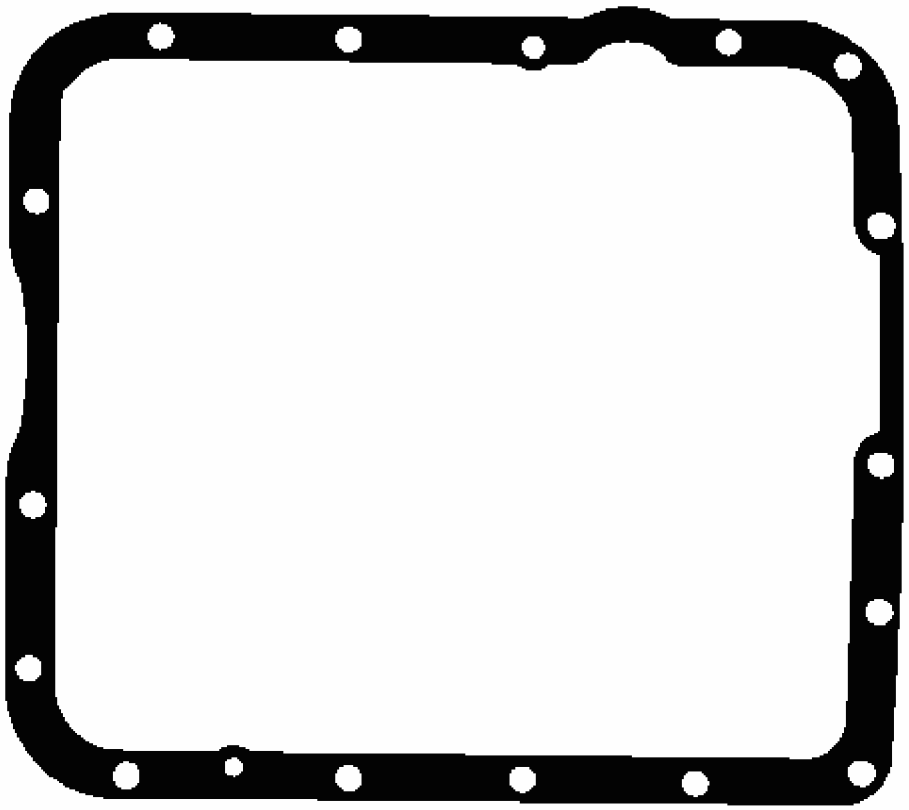

Fig. 1: Identifying Oil Pan Gasket (Hydra-Matic 4L60-E)
Courtesy of GENERAL MOTORS CORP.

LUBRICATION

SERVICE INTERVALS

Transmission

Check transmission fluid level at each engine oil change. Under normal driving conditions, change transmission fluid and filter every 50,000 miles. Under severe driving conditions, change transmission fluid and filter every 15,000 miles.

Transfer Case

Check transfer case fluid level at each engine oil change. Under normal driving conditions, change transmission fluid every 50,000 miles.

CHECKING FLUID LEVELS

CAUTION: Do not overfill. Transmission temperature must be at least 180°F (82°C) when checking fluid level. If cold, fluid level will rise from ADD 1 PT. or .5L to FULL mark on dipstick as transmission reaches normal operating temperature.

Transmission

With vehicle parked on a level surface and engine at idle, move range selector lever through all ranges, ending in Park. Remove dipstick, wipe clean and check fluid level. Fluid level should be between ADD 1 PT. and FULL marks on dipstick. If vehicle has been driven for extended period of time at high speed, in city traffic or pulling a trailer, an accurate fluid level cannot be immediately determined. Allow transmission to cool for about 30 minutes after vehicle is parked, then check fluid level.

Transfer Case

Remove fill plug. Check oil level. If oil level is even with bottom of fill plug opening, level is okay. If level is lower than bottom of fill plug opening, add lubricant as necessary.

RECOMMENDED FLUIDS

Transmission

Manufacturer recommends Dexron-III ATF.

Transfer Case

Manufacturer recommends Automatic Transfer Case Fluid (GM P/N 12378396), or equivalent.

FLUID CAPACITIES

Transmission

The following refill capacities given are approximate. Correct fluid level should always be determined by marks on dipstick, rather than amount of fluid added. DO NOT overfill. See **TRANSMISSION FLUID CAPACITIES** table.

TRANSMISSION FLUID CAPACITIES

Application	Refill - Qts. (L)	Dry Fill - Qts. (L)
4L60-E	5.0 (4.8)	11.0 (10.6)

Transfer Case

The following refill capacities given are approximate. Correct fluid level should always be

determined by level of fluid at fill plug hole, rather than amount of fluid added. DO NOT overfill. See **TRANSFER CASE FLUID CAPACITIES** table.

TRANSFER CASE FLUID CAPACITIES

Application	Drain & Fill - Qts. (L)
NV136	2.0 (1.9)
NV233	1.06 (1.0)
NV236	2.0 (1.9)

DRAINING & REFILLING

NOTE: Some transmissions are equipped with a reusable oil pan gasket. Reusable oil pan gasket are constructed of rubber with metal or plastic backing. On transmissions equipped with reusable gasket, sealing surface of oil pan is flat. Transmissions not equipped with reusable-type gasket have a ridge on sealing surface of oil pan must have a new gasket every time pan is removed. Clean reusable gasket with solvent. Inspect reusable gasket for damage and replace as necessary. Using any other type of gasket in place of reusable gasket may result in fluid leaks.

Transmission

1. Raise and support the vehicle. Place a drain pan under the transmission oil pan. Remove the oil pan drain plug.
2. Remove the oil pan bolts. Remove the oil pan and the gasket.
3. Remove the fluid filter and the seal. Remove the filter seal. The filter seal may be stuck in the pump. If necessary, carefully use pliers or another suitable tool to remove the seal. See **Fig. 2** . Discard the seal.
4. Coat the NEW seal with a small amount of Transmission Assembly Lubricant (J-36850) or equivalent.
5. Install the NEW filter neck seal into the transmission case. Install the filter into the case. See **Fig. 3** .
6. Install the oil pan and a new gasket. Install the oil pan bolts. Tighten oil pan-to-transmission case bolts to specification. See **TORQUE SPECIFICATIONS** .
7. Apply a small amount of Sealant (GM P/N 12346004) to the threads of the oil pan drain plug.
8. Install the oil pan drain plug. Tighten oil pan drain plug to specification. See **TORQUE SPECIFICATIONS** .
9. Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **RECOMMENDED FLUIDS** and **FLUID CAPACITIES** .

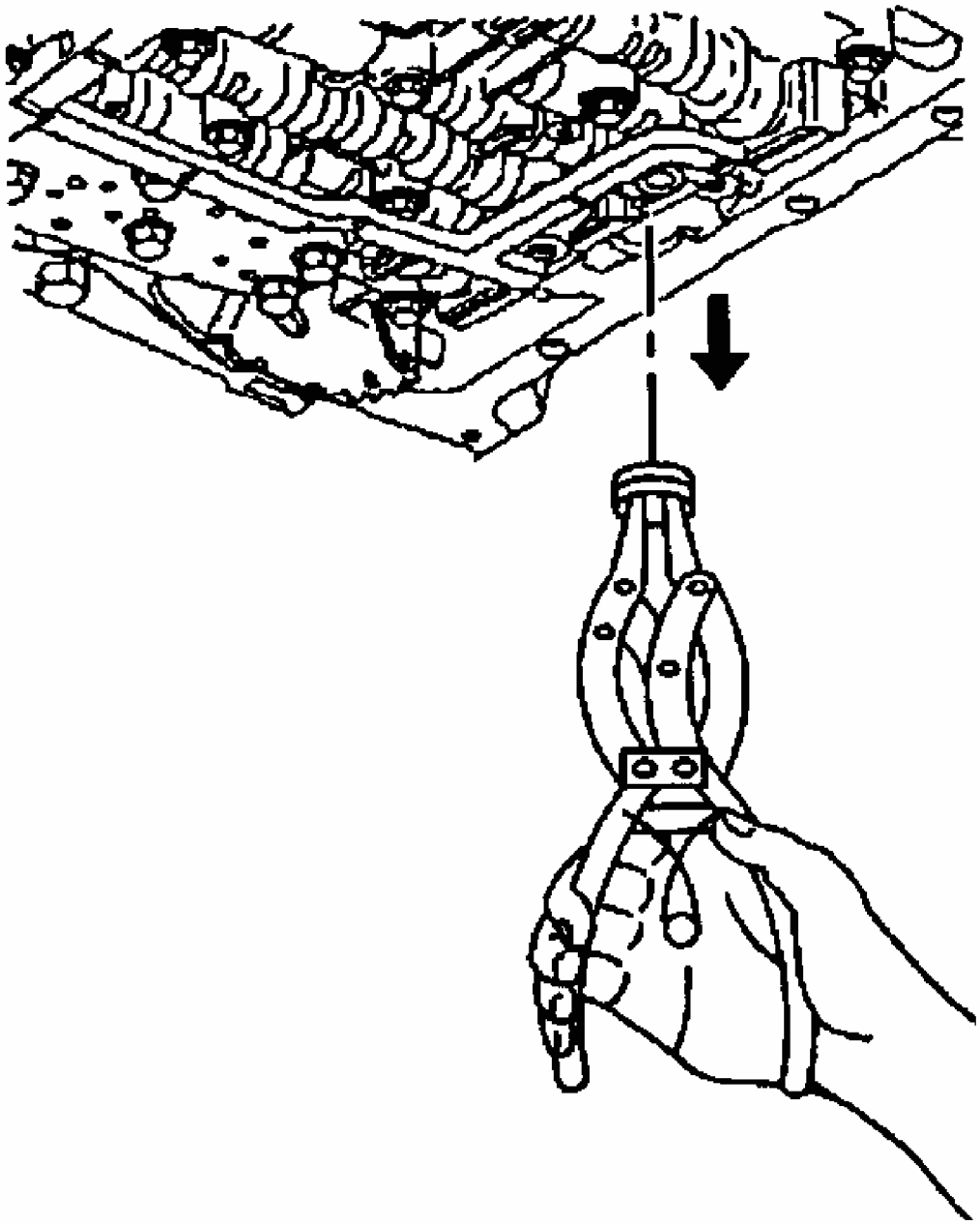

Fig. 2: Removing Seal From Transmission
Courtesy of GENERAL MOTORS CORP.

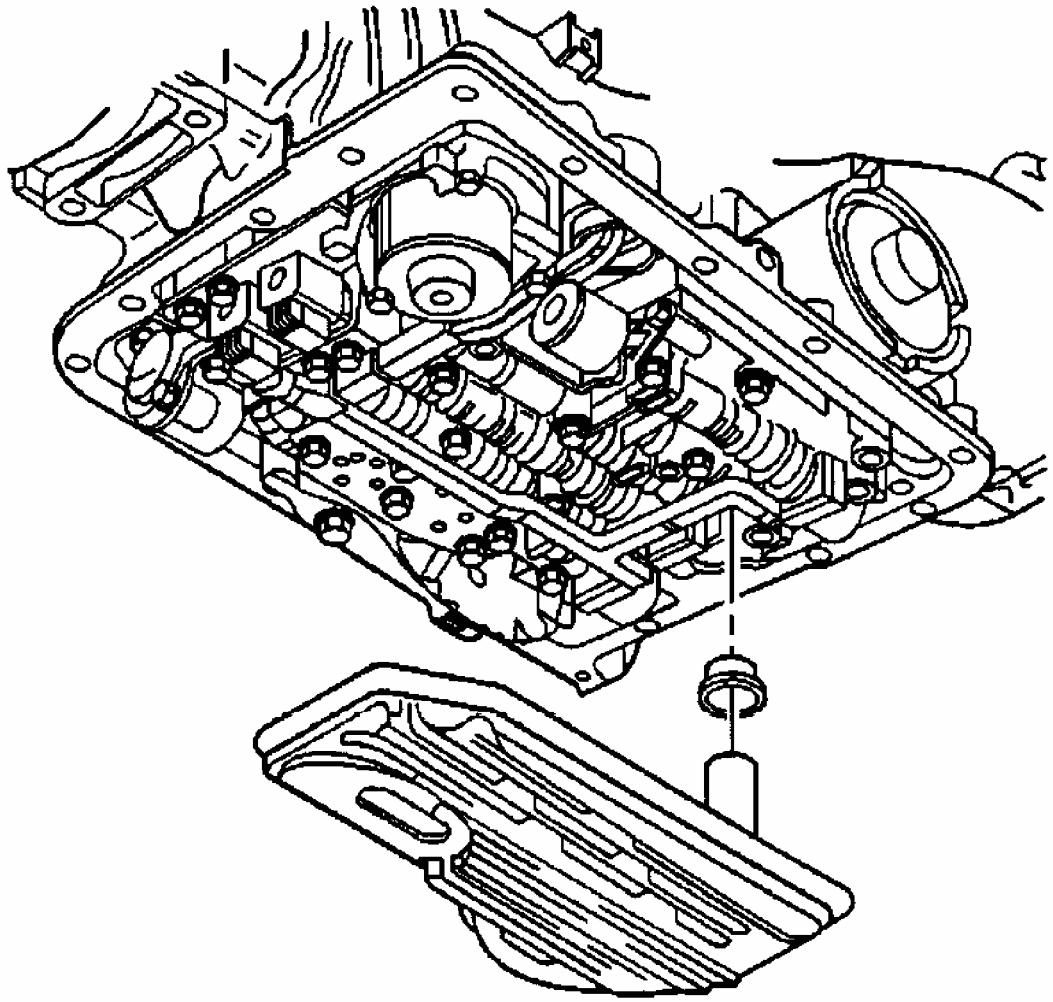

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Fig. 3: Removing & Installing Filter & Seal
Courtesy of GENERAL MOTORS CORP.

Transfer Case

Remove fill and drain plugs from transfer case. After fluid has drained, reinstall drain plug and tighten to specification. See **TORQUE SPECIFICATIONS** . Fill transfer case to proper level. See **FLUID CAPACITIES** and **CHECKING FLUID LEVELS** . Install transfer case fill plug and tighten to specification.

OIL COOLER FLUSHING

NOTE: Do not use solutions that contain alcohol or glycol. Use of solutions that contain alcohol or glycol may damage flushing equipment, oil cooler components and/or transmission

components.

CAUTION: Flushing Solution (J-35944-22) is environmentally safe, yet powerful enough to cut through transmission fluid to dislodge any contaminants from the cooler. The safety precautions on the label regarding potential skin and eye irritations associated with prolonged exposure are typical precautions that apply to many similar cleaning solutions. It should be noted that according to General Motors, use of other non-approved fluids for cooler flushing can have an adverse reaction to the seals inside the transmission.

Preparation

1. After the repair or replacement transmission is installed in the vehicle, do not reconnect the oil cooler pipes.
2. Remove the fill cap (9) on the Transmission Oil Cooler and Line Flusher (J-35944-A) and fill the flusher tank (4) with 20-21 oz. (0.6L) of flushing solution using the measuring cup (6). DO NOT overfill. Install the fill cap (9) on the flusher and pressurize the flusher tank (4) to 80-100 psi (550-700 kPa), using the shop air supply at the tank air valve (9). See **Fig. 4** .
3. Connect the flusher discharge hose (5) to the oil cooler return pipe (top connector) (may require J-35944-600). Clip the discharge hose (5) onto the oil drain container. Attach the flusher to the undercarriage of the vehicle with the hook provided, and connect the flushing system feed supply hose (3) from the flusher to the oil cooler feed pipe (bottom connector) (may require J-35944-600). See **Fig. 5** .
4. With the water supply valve (1) on the flusher in the OFF position, connect the water supply hose (7) from the flusher to the water supply at the faucet. See **Fig. 4** and **Fig. 5** . Turn ON the water supply at the faucet.

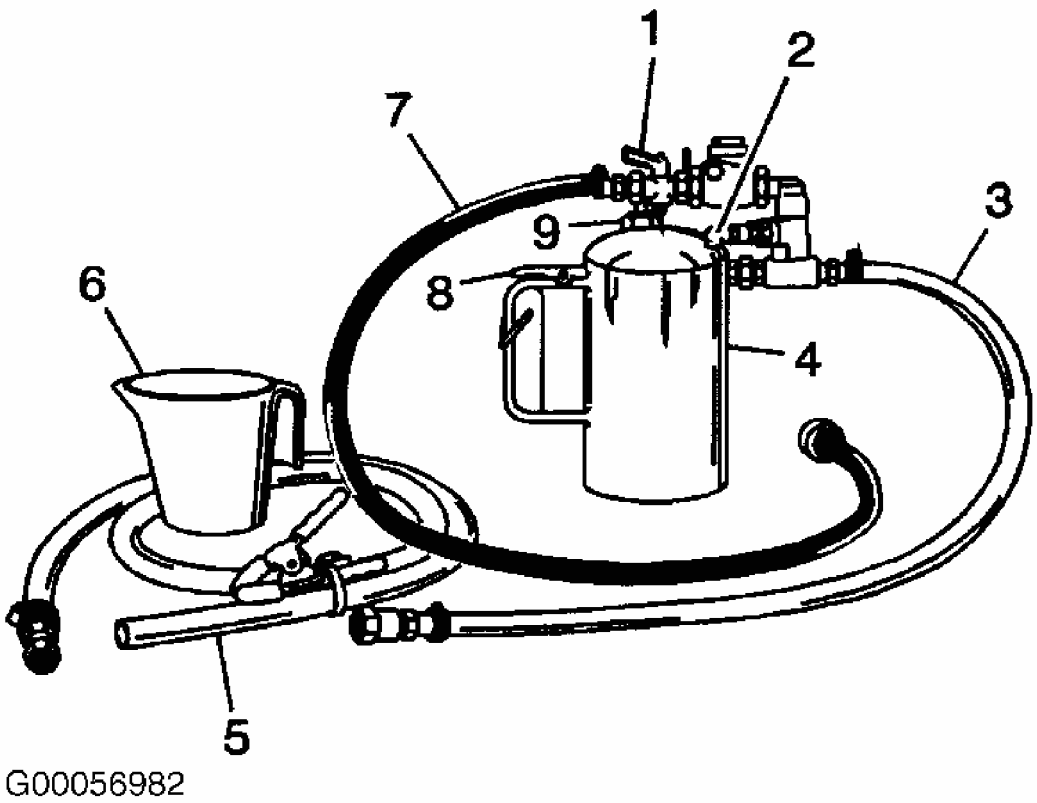

Fig. 4: Identifying Flushing Equipment
Courtesy of GENERAL MOTORS CORP.

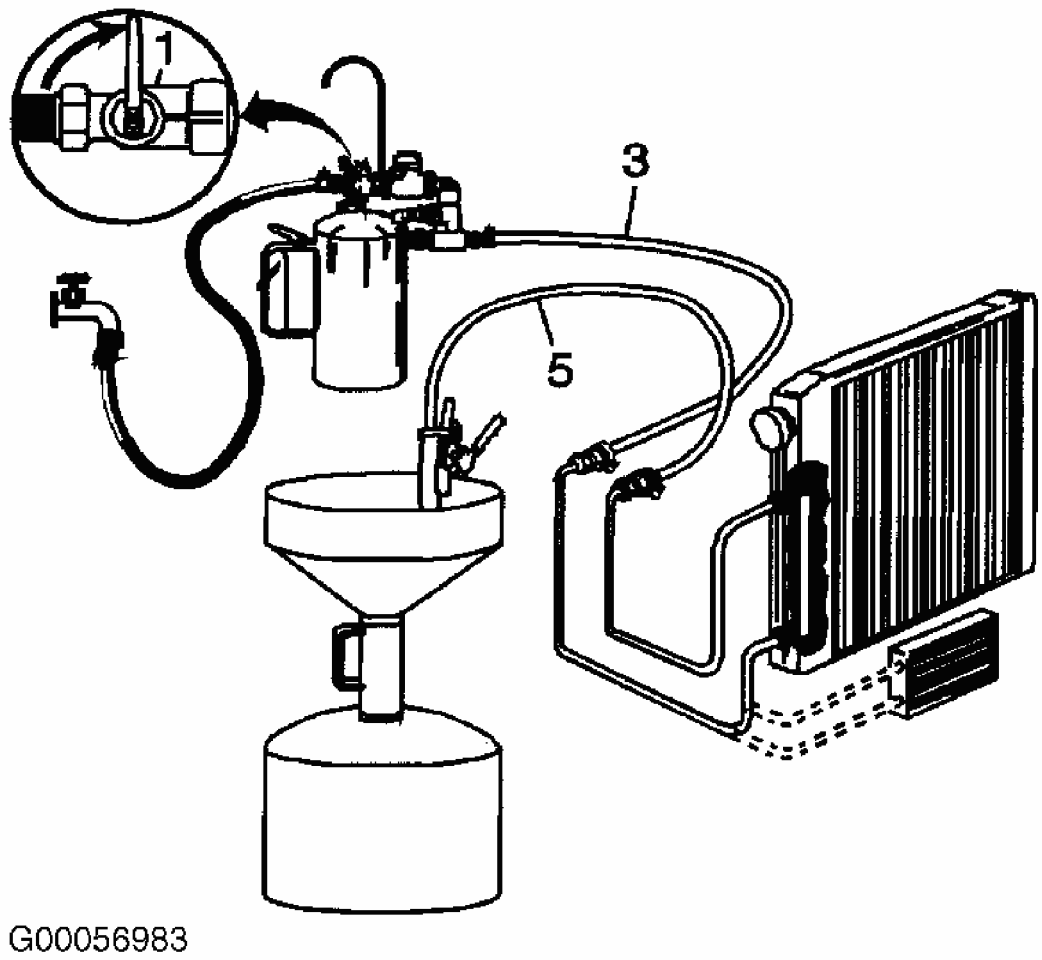

Fig. 5: Connecting Flushing Equipment
Courtesy of GENERAL MOTORS CORP.

Initial Flush

1. Turn the (J-35944-A) water supply valve (1) to the ON position and allow water to flow through the oil cooler and pipes for 10 seconds to remove any remaining transmission fluid. See **Fig. 6** . If water does not flow through the oil cooler and pipes, the cause of the blockage must be diagnosed and the plugged component must be repaired or replaced. Continue with the cooler flushing and flow check procedure once the blockage is corrected.
2. Turn the flusher water supply valve (1) to the OFF position and clip the discharge hose (5) onto an appropriate container with a lid, to avoid splashback. See **Fig. 7** . Turn the flusher water supply valve (1) to the ON position and depress the trigger (8) to mix cooler flushing solution into the water flow. See **Fig. 4** . Use the clip provided on the handle to hold the trigger (8) down. The discharge will foam vigorously when the

solution is introduced into the water stream.

NOTE: Flushing for approximately 2 minutes in each cooler line direction will result in a total of about 8-10 gallons of waste fluid. This mixture of water and flushing fluid is to be captured in an appropriate container for proper disposal.

3. Flush the oil cooler and pipes with water and solution for 2 minutes. During this flush, attach the shop air supply of 120 psi (825 kPa) to the flushing system feed air valve (2) located on the flusher for 3-5 seconds at the end of every 15-20 second interval to create a surging action.
4. Release the trigger (8) and turn the flusher water supply valve (1) to the OFF position.

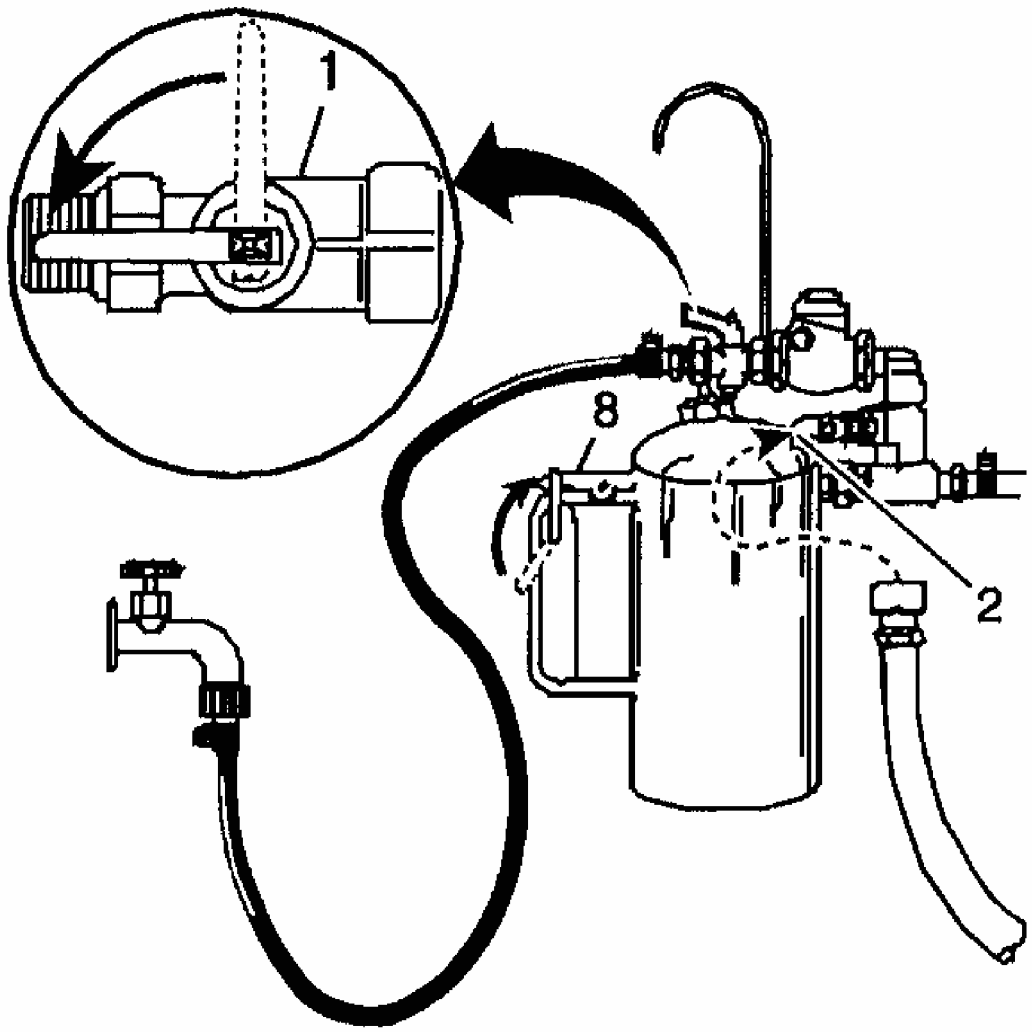

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Fig. 6: Flushing Oil Cooling System
Courtesy of GENERAL MOTORS CORP.

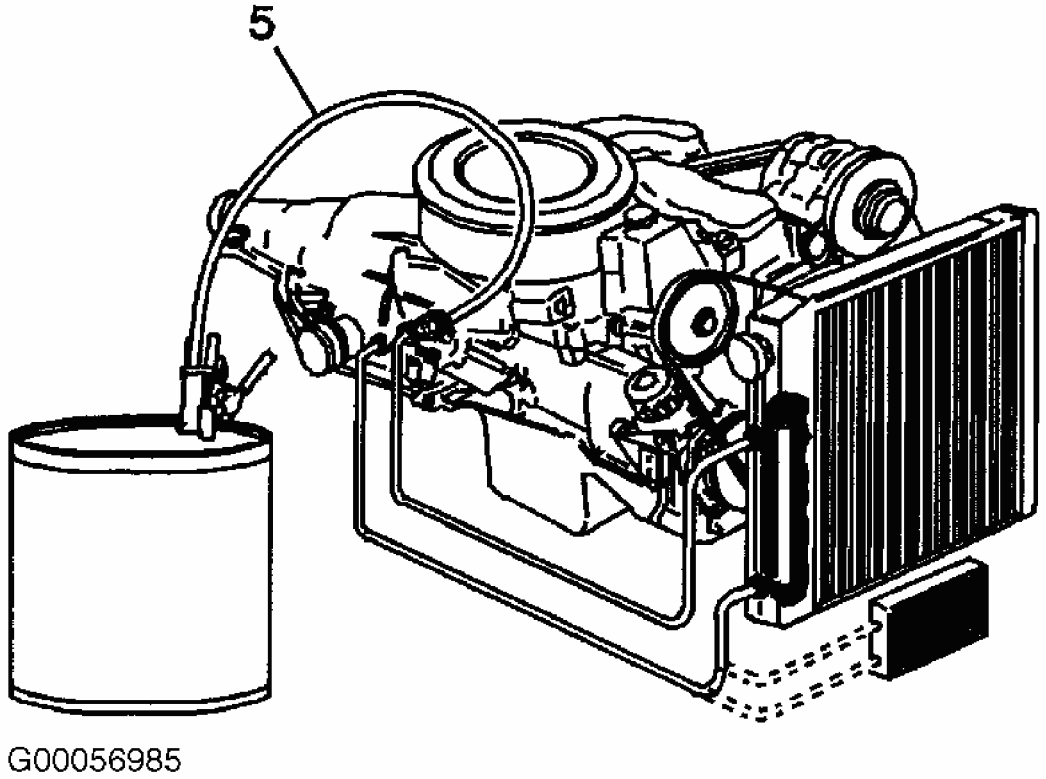

Fig. 7: Capturing Fluid Discharge
Courtesy of GENERAL MOTORS CORP.

Back Flush

1. Disconnect both hoses from the oil cooler pipes and then connect them to the opposite oil cooler pipe. This will allow the oil cooler and pipes to be back flushed. Repeat steps 2 and 3 of the INITIAL FLUSH procedure. Release the trigger (8) of the flusher and allow water only to rinse the oil cooler and pipes for one minute.
2. Turn the flusher water supply valve (1) to the OFF position and turn OFF the water supply at the faucet. Attach the shop air supply to the flushing system feed air valve (2) on the flusher, and blow out the water from the oil cooler and pipes. Continue until no water comes out of the discharge hose (5).

TRANSMISSION & OIL COOLER FLOW CHECK

1. Disconnect both hoses from the oil cooler pipes. Connect the oil cooler feed pipe (bottom connector) to the transmission and the return pipe (top connector) (may require

J 35944-600) to the discharge hose (5). Clip the discharge hose (5) onto the empty oil drain container. See **Fig. 7** .

2. Confirm the transmission is filled with ATF. See **CHECKING FLUID LEVELS** . Start the engine with the transmission in PARK range and run for 30 seconds. A minimum of 2 qts. (1.9L) must be discharged during this 30-second run time. If fluid flow is greater than 2 qts. (1.9L) in 30 seconds, go to next step. If fluid flow is less than 2 qts. (1.9L) in 30 seconds, perform the following diagnosis: Disconnect the oil cooler feed line at the radiator. Connect the discharge hose (5) to the cooler feed line. Clip the discharge hose (5) to the empty oil drain container. See **Fig. 7** . Start the engine with the transmission in PARK range and run for 30 seconds. A minimum of 2 qts. (1.9L) must be discharged during this 30-second run time. Perform the following according to the flow rate:
   - Insufficient feed flow: Inspect the transmission.
   - Sufficient feed flow: Inspect the oil cooler return pipe and the oil cooler (and auxiliary cooler, if equipped).
3. Remove the discharge hose (5), reconnect the cooler feed and return pipes to the transmission and fill the transmission with appropriate fluid to proper level. See **FLUID CAPACITIES** and **CHECKING FLUID LEVELS** . Inspect the transmission oil cooler pipe connections at the radiator, the auxiliary cooler (if equipped) and the transmission for leaks.

ON-VEHICLE REPAIRS

Various components may be serviced without transmission removal, depending on application. For servicing of these components, see appropriate component under **ADJUSTMENTS** and/or **REMOVAL & INSTALLATION** . For additional information on testing electrical components, see appropriate DIAGNOSIS article in AUTOMATIC TRANSMISSIONS.

ADJUSTMENTS

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

PARK/NEUTRAL POSITION SWITCH

With an assistant in driver's seat, raise and support vehicle. The transmission must be in the PARK or NEUTRAL position only. Loosen the switch retaining bolts and rotate the switch slightly, while assistant attempts to start engine. After engine starts, turn engine off. Tighten PNP switch bolts to specification. See **TORQUE SPECIFICATIONS** . Ensure vehicle does not start in any range other than Park and Neutral. Replace the PNP switch if proper operation can not be achieved.

SHIFT CABLE

1. Position the gearshift lever into Park. Apply the parking brake.
2. Raise and support the vehicle. Disconnect shift cable at transmission bracket. See **Fig. 8** . Position the transmission range lever to Park. Rotate the range select lever clockwise until it reaches the full mechanical stop position.
3. Install the transmission shift cable into the bracket with the cable adjustment button up. See **Fig. 9** .
4. Install the shift cable to the range selector lever pin. Press cable adjustment button down. Insert the retainer to the shift cable.
5. Lower the vehicle. Check for proper shift cable operation. Replace cable if cable binds or does not adjust properly.

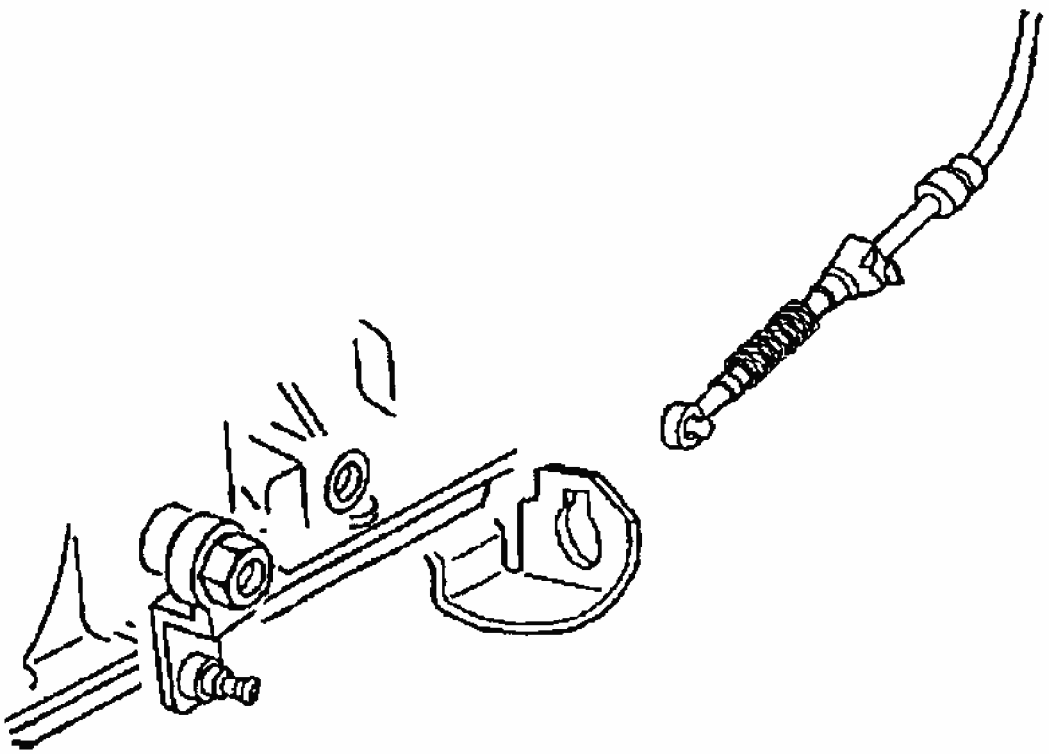

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Fig. 8: Removing & Installing Cable At Transmission Bracket
Courtesy of GENERAL MOTORS CORP.

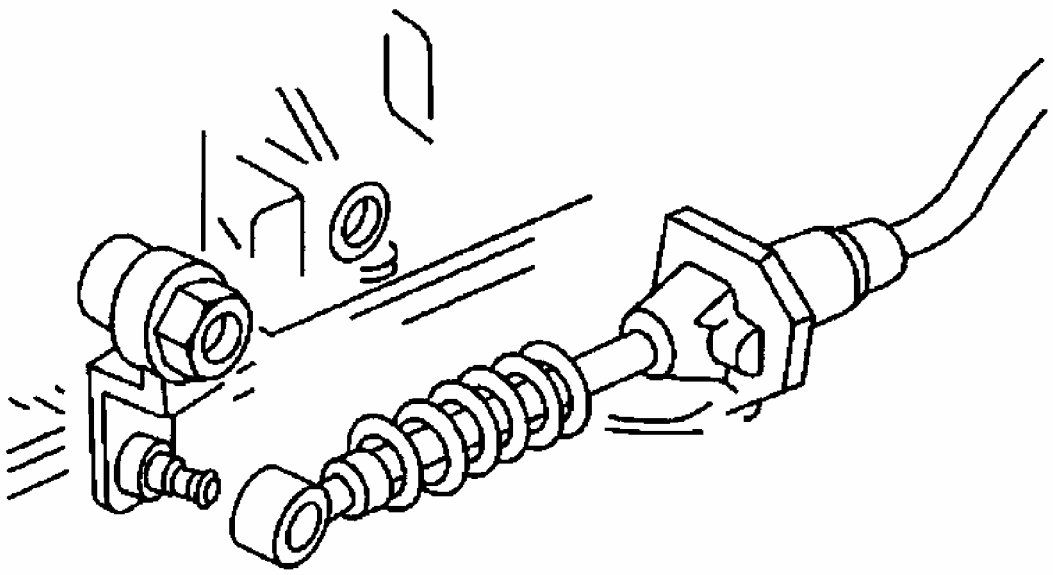

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Fig. 9: Adjusting Shift Cable
Courtesy of GENERAL MOTORS CORP.

REMOVAL & INSTALLATION

WARNING: Vehicle is equipped with Supplemental Inflatable Restraint (SIR) system. When servicing vehicle, use care to avoid accidental air bag deployment. SIR system-related components are located in various locations throughout interior and exterior of vehicle, depending on application. Do not use electrical test equipment on or near these circuits. If necessary, deactivate SIR system before servicing components. See AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. Before disconnecting battery, see COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION.

ACCUMULATOR ASSEMBLY

NOTE: Tools required: Pump and Valve Body Alignment Pin Set (J-25025-B), and Transmission Assembly Lubricant (J-36850) or equivalent.

Removal

1. Raise and support the vehicle. Remove the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION.

NOTE: The 1-2 accumulator can be removed without removing the control valve assembly.

2. Remove the control valve body. See **VALVE BODY & PRESSURE SWITCH** . Remove the accumulator cover retaining bolts. See **Fig. 10** .
3. Remove the 1-2 accumulator cover assembly. Disassemble the 1-2 accumulator. Blow compressed air into the 1-2 accumulator cover, as shown, to remove the 1-2 accumulator piston. See **Fig. 11** . Remove the 1-2 accumulator inner and outer springs.
4. Inspect the 1-2 accumulator inner and outer springs for cracks. Remove the 1-2 accumulator piston seal (1) from the 1-2 accumulator piston. See **Fig. 12** . Inspect the 1-2 accumulator piston for the following defects: porosity, cracks, scoring, nicks and scratches.
5. Inspect the 1-2 accumulator cover for the following defects: porosity, cracks, scoring, nicks and scratches. See **Fig. 13** . Remove the spacer plate support retaining bolts. See **Fig. 14** .
6. Use care not to drop the following items that will be removed along with the spacer plate: the No. 1 checkball, the 3-4 accumulator spring and the 3-4 accumulator pin.
7. Remove the spacer plate support. See **Fig. 15** . Remove the spacer plate to valve body gasket, the spacer plate and the spacer plate to transmission case gasket. Remove the 3-4 accumulator piston (2). See **Fig. 16** .
8. Inspect the 3-4 accumulator spring for cracks. Remove the 3-4 accumulator piston seal (1) from the 3-4 accumulator piston. See **Fig. 12** . Inspect the 3-4 accumulator piston for the following defects: porosity, cracks, scoring, nicks and scratches.

Installation

1. Install a new 3-4 accumulator piston seal (1) to the 3-4 accumulator piston. See **Fig. 12** .
2. Install the 3-4 accumulator pin (1) into the transmission case and retain the pin with assembly lubricant. See **Fig. 17** . Install the 3-4 accumulator piston (2) onto the pin (1) in the transmission case. Ensure that the 3-4 accumulator piston legs face away from the transmission case.

NOTE: The case gasket is identified by a "C". Ensure to place the case gasket on the transmission case side of the spacer plate. The valve body gasket is identified by a "V". Ensure to place the valve body gasket on the valve body side of the spacer plate.

3. Install the alignment pin (2, 3) to the transmission case. Install the spacer plate to transmission case gasket and the spacer plate to valve body gasket to the spacer plate. Use assembly lubricant in order to retain the gaskets to the spacer plate.
4. Ensure that the solenoid screens (1, 2) are in place on the spacer plate. Place the checkball (3) on the spacer plate in the location shown. See **Fig. 18** . Place the 3-4 accumulator spring (4) on the spacer plate. Install the spacer plate and related components to the transmission. Install the spacer plate support and the spacer plate support retaining bolts. Tighten the spacer plate support retaining bolts to specification. See **TORQUE SPECIFICATIONS** .
5. After installing the spacer plate support (2), look through the hole in the spacer plate to ensure that the checkball (1) has remained in the proper location. See **Fig. 19** .
6. Install a new 1-2 accumulator piston seal (1) to the 1-2 accumulator piston. See **Fig. 12** . Install the 1-2 accumulator inner and outer springs to the 1-2 accumulator cover. See **Fig. 11** . Install the 1-2 accumulator piston onto the pin in the 1-2 accumulator cover. Ensure that the piston legs face the accumulator cover.
7. Install the 1-2 accumulator cover and the accumulator cover retaining bolts. See **Fig. 10** . Tighten the accumulator cover retaining bolts to specification. See **TORQUE SPECIFICATIONS** .
8. Remove the alignment pin from the transmission case. Install the control valve body. See **VALVE BODY & PRESSURE SWITCH** . Install the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

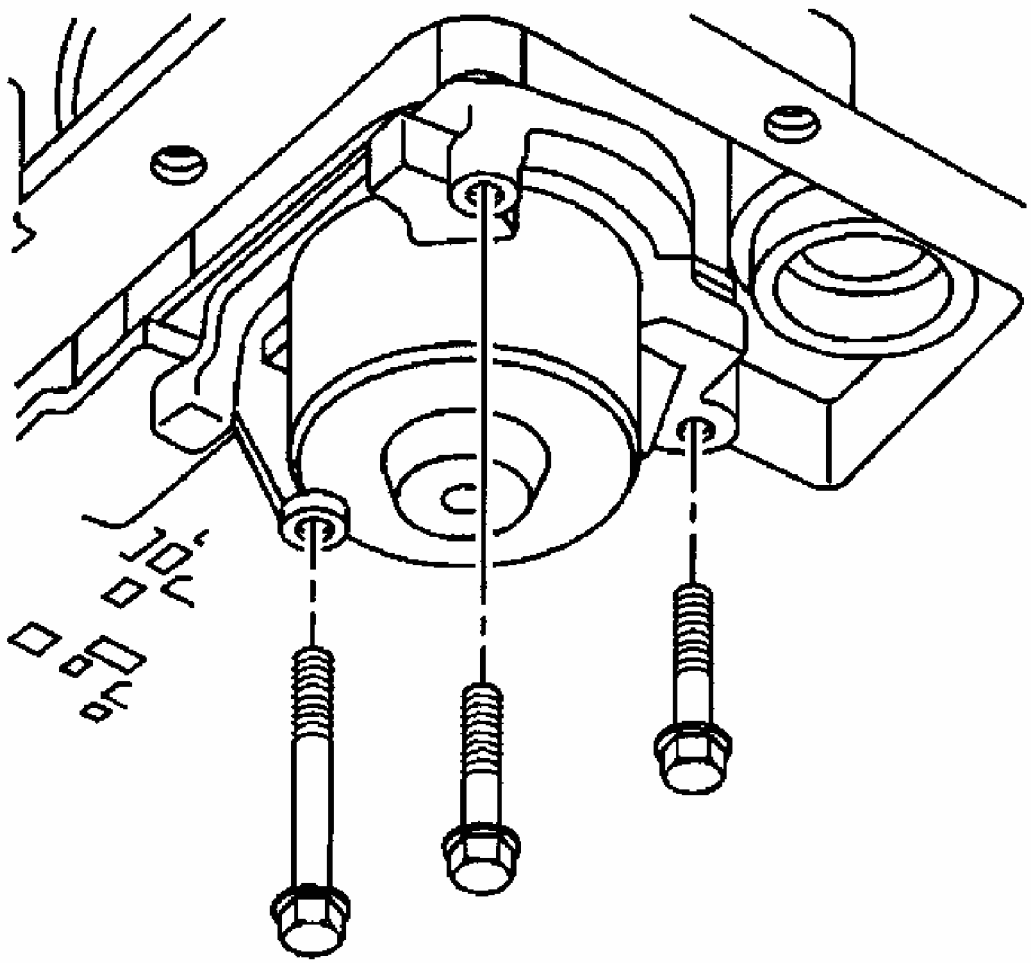

Fig. 10: Removing & Installing Accumulator Assembly Bolts
Courtesy of GENERAL MOTORS CORP.

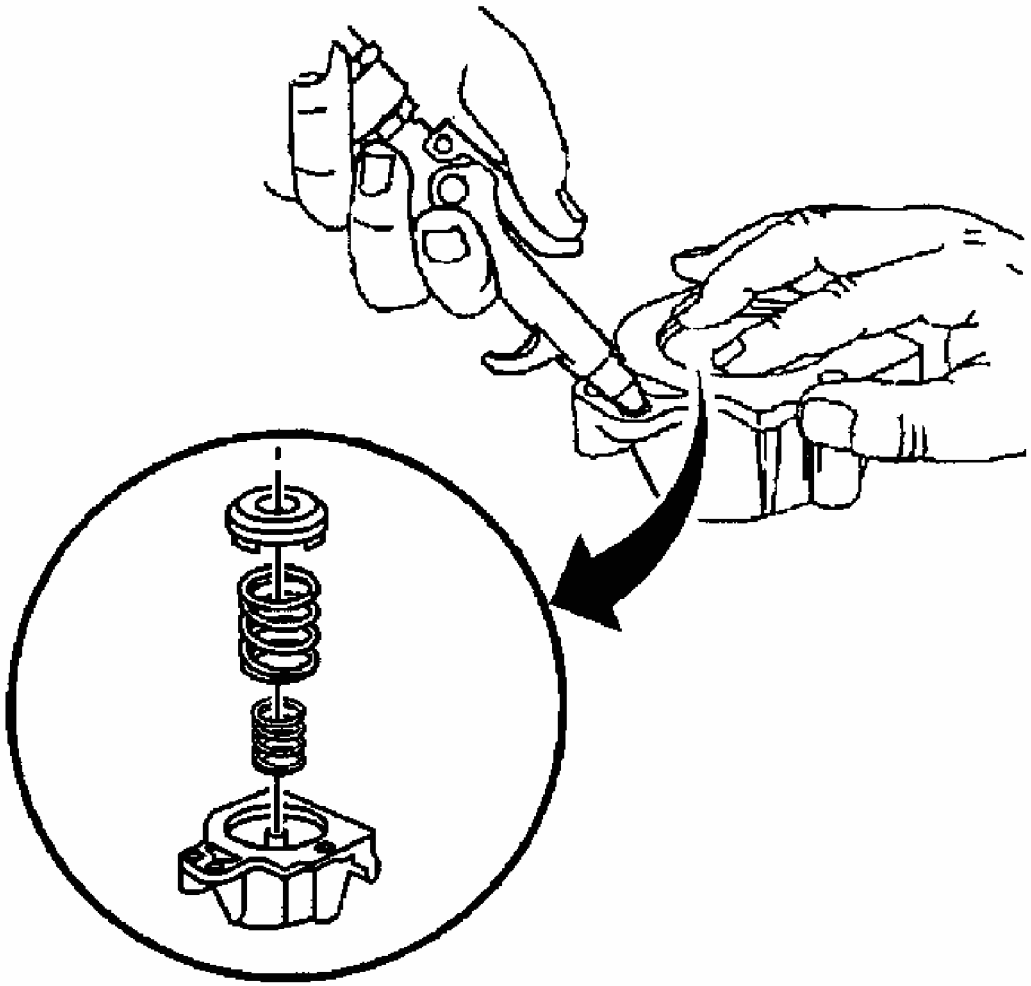

Fig. 11: Applying Compressed Air Into 1-2 Accumulator
Courtesy of GENERAL MOTORS CORP.

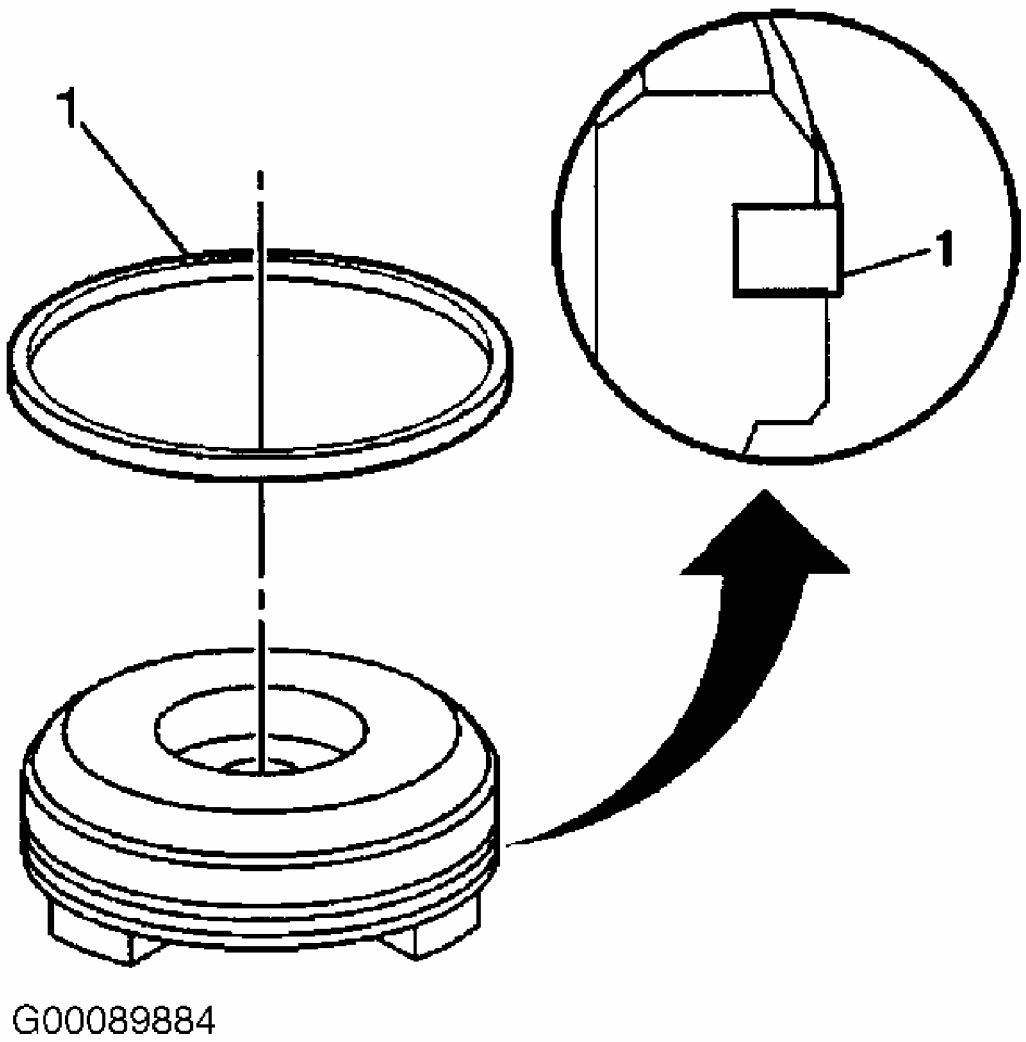

Fig. 12: Removing & Installing Accumulator Seals
Courtesy of GENERAL MOTORS CORP.

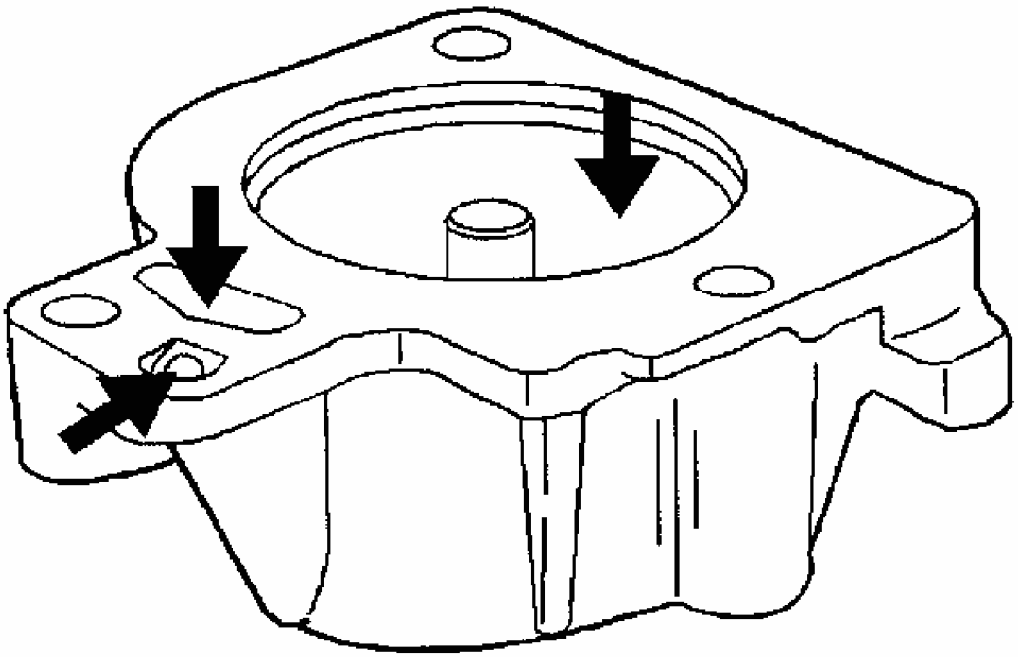

Fig. 13: Inspecting Accumulator Cover For Damage
Courtesy of GENERAL MOTORS CORP.

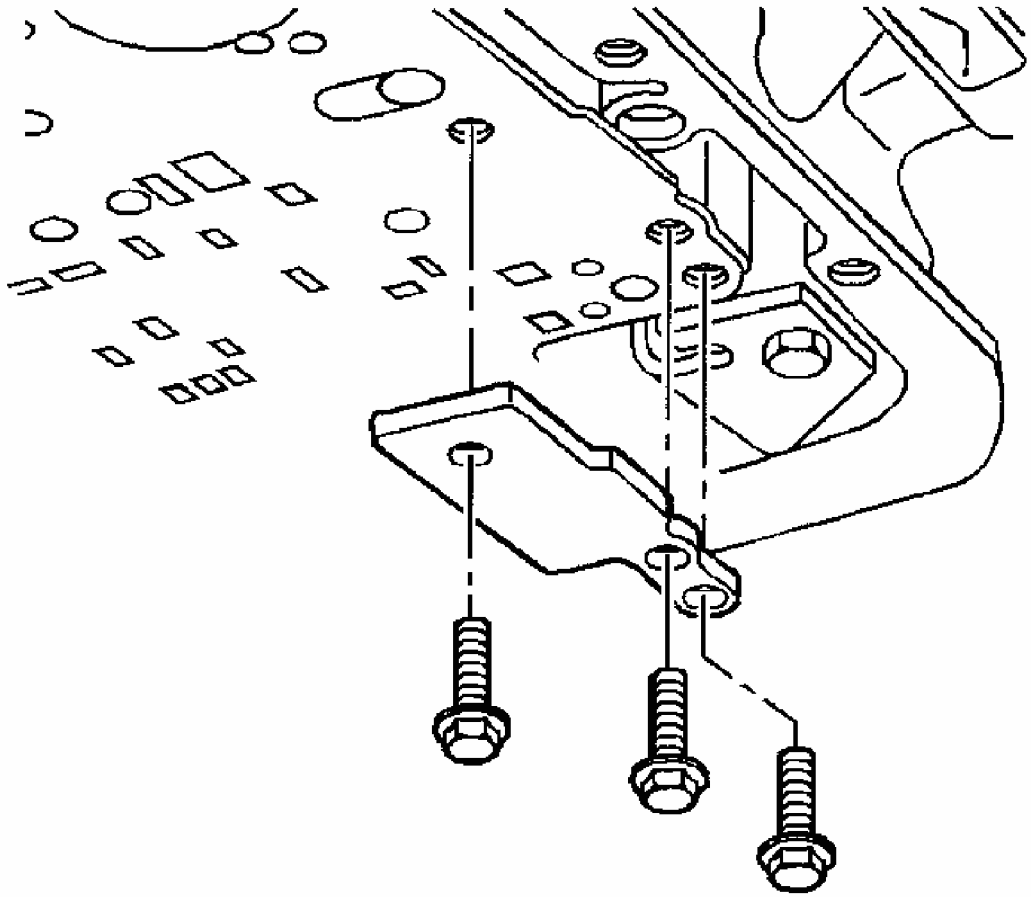

Fig. 14: Removing & Installing Oil Pass Cover
Courtesy of GENERAL MOTORS CORP.

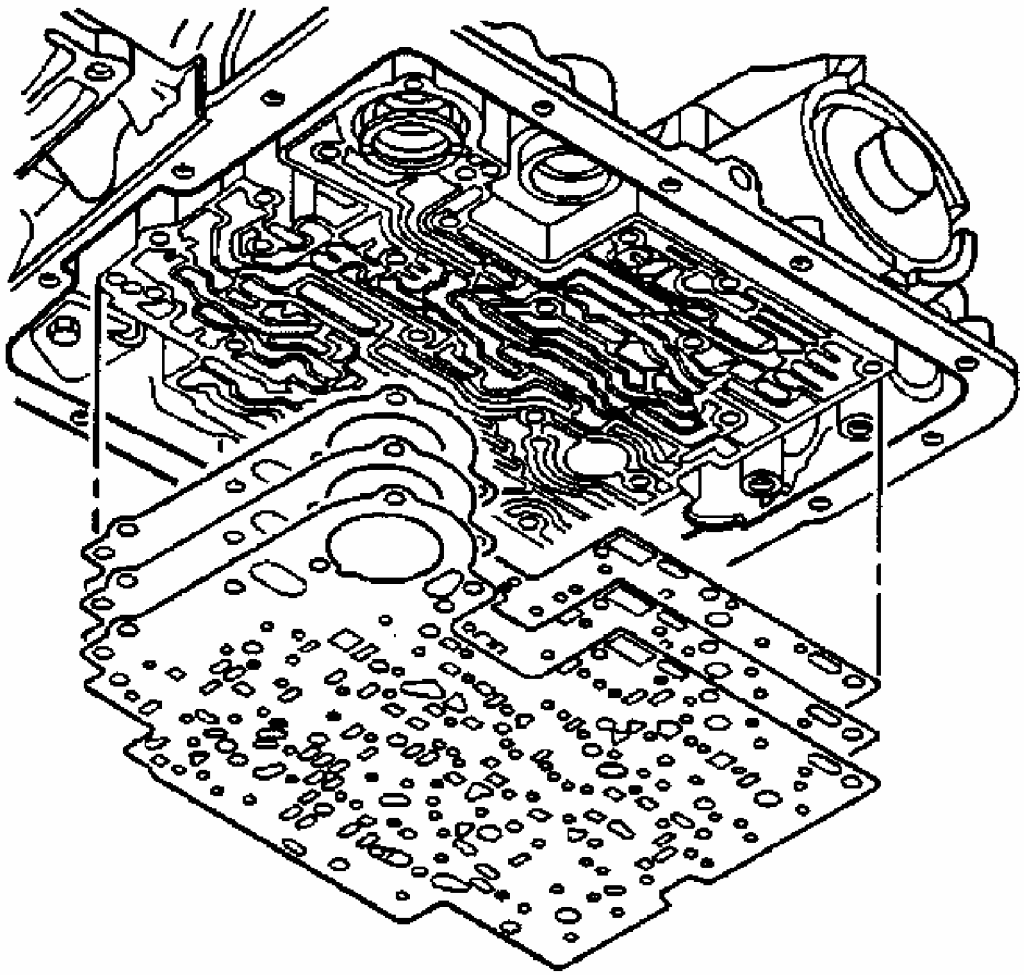

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Fig. 15: Removing & Installing Spacer Plates
Courtesy of GENERAL MOTORS CORP.

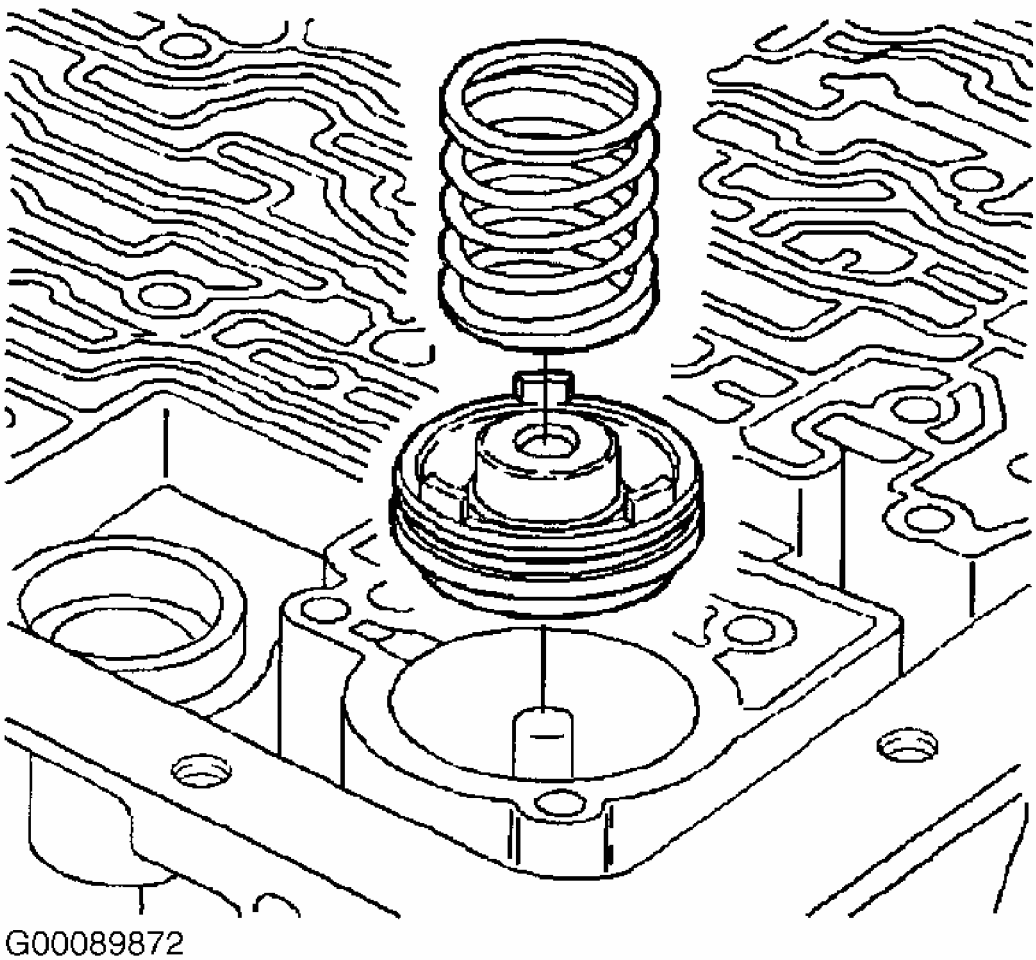

Fig. 16: Removing & Installing 3-4 Accumulator Piston
Courtesy of GENERAL MOTORS CORP.

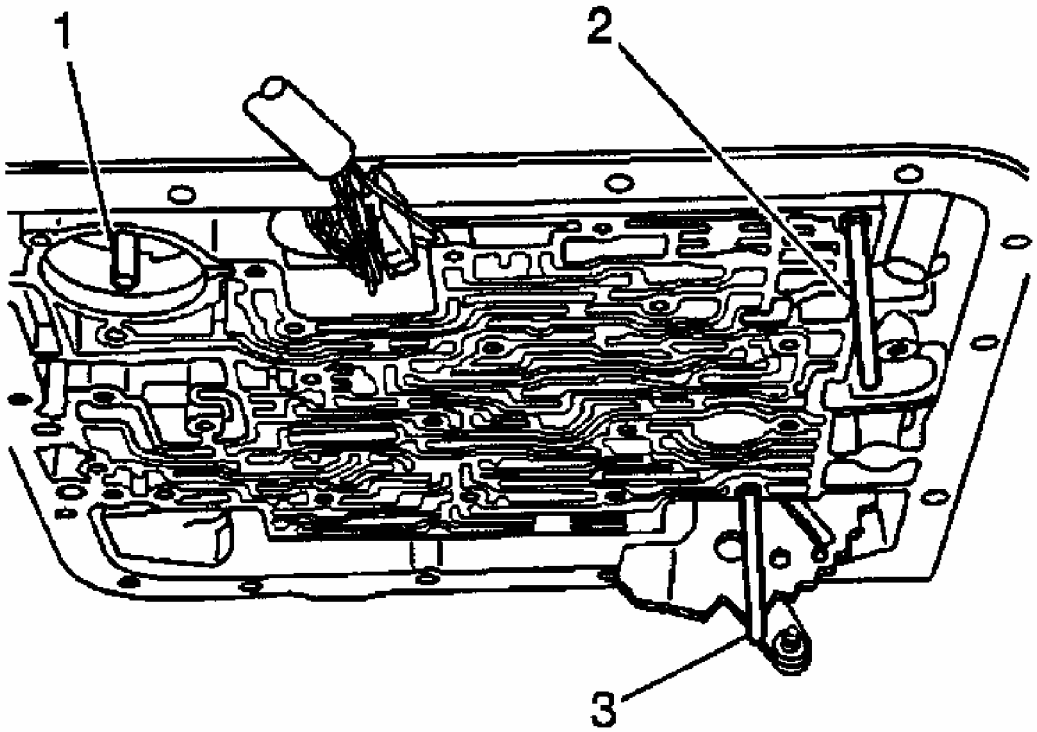

Fig. 17: Installing 3-4 Accumulator Pin
Courtesy of GENERAL MOTORS CORP.

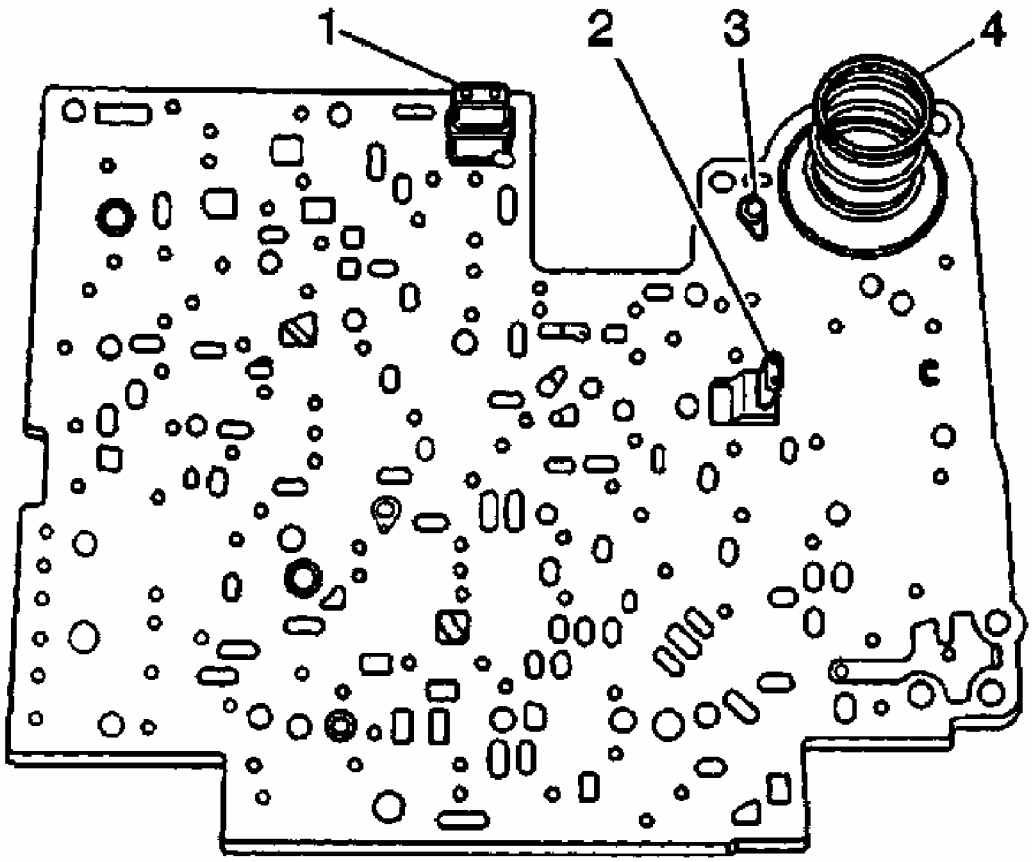

Fig. 18: Installing Spacer Plate Gaskets
Courtesy of GENERAL MOTORS CORP.

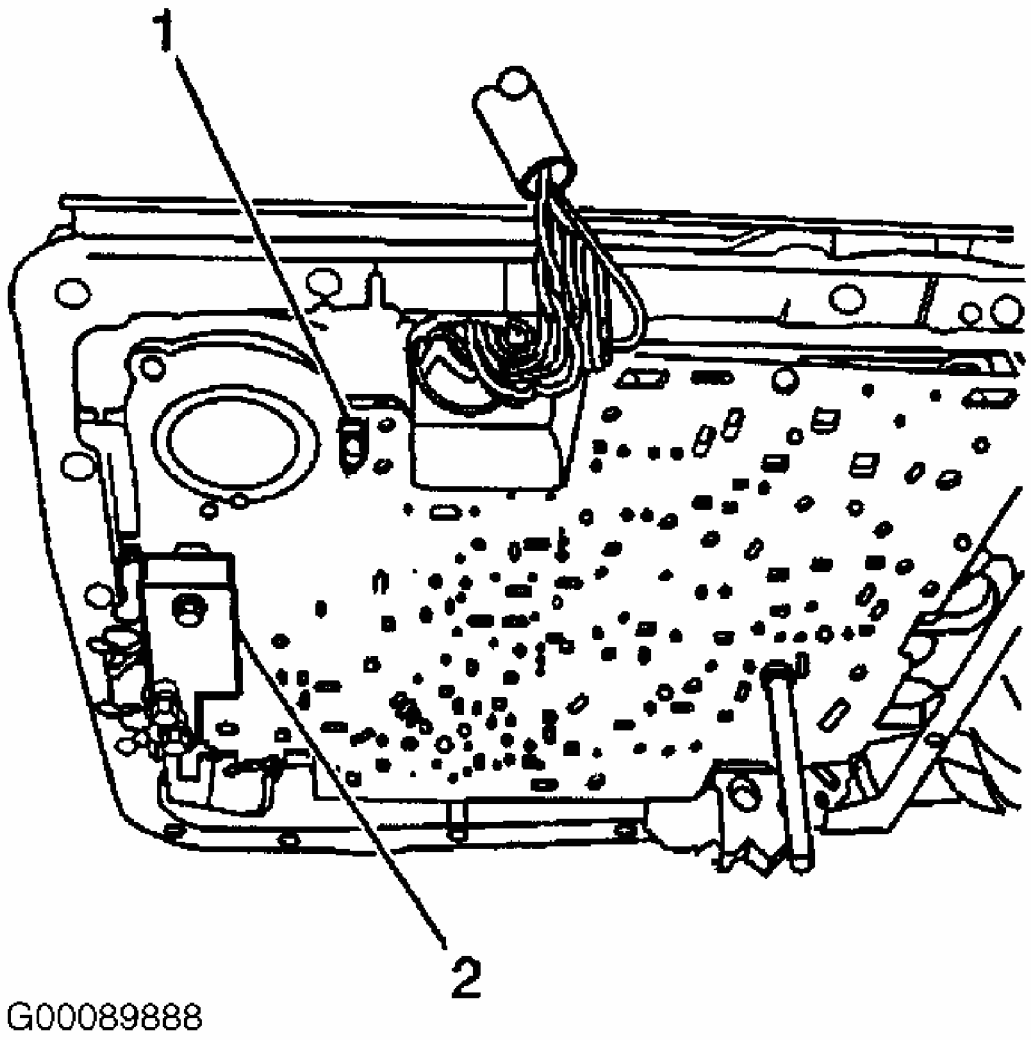

Fig. 19: Inspecting Spacer Plate For Proper Check Ball Location
Courtesy of GENERAL MOTORS CORP.

CONTROL & SHIFT SOLENOIDS

Removal

1. Remove the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION.

NOTE: Do not remove the valve body for the following procedures. Removal of the 1-2 accumulator is necessary only if servicing the pressure control solenoid.

2. Remove the 1-2 accumulator if necessary. See **ACCUMULATOR ASSEMBLY** .
3. Disconnect the internal wiring harness electrical connectors from the following components:
   - Transmission fluid pressure switch (1). See **Fig. 20** .
   - 1-2 shift control solenoid (2).
   - 2-3 shift control solenoid (3).
   - Pressure control solenoid (4).
   - 3-2 control solenoid (6).
   - TCC PWM solenoid (5).
4. Remove the pressure control solenoid retainer. Remove the pressure control solenoid. See **Fig. 21** .
5. Remove the 1-2 and 2-3 shift solenoid retainers. Remove the 1-2 and 2-3 shift solenoids. See **Fig. 22** .
6. Remove the 3-2 control solenoid retainer. Remove the 3-2 control solenoid. See **Fig. 22** .

Installation

1. Install the 3-2 control solenoid. Install the 3-2 control solenoid retainer. Install the 1-2 and 2-3 shift solenoids. See **Fig. 22** .
2. Install the 1-2 and 2-3 shift solenoid retainers. Install the pressure control solenoid. Ensure that the electrical tabs are facing outboard. See **Fig. 22** .
3. Install the pressure control solenoid retainer and retaining bolt. Tighten the pressure control solenoid retaining bolt to specification. See **TORQUE SPECIFICATIONS** .
4. Connect the internal wiring harness electrical connectors to the following components:
   - Transmission fluid pressure switch (1). See **Fig. 20** .
   - 1-2 shift control solenoid (2).
   - 2-3 shift control solenoid (3).
   - Pressure control solenoid (4) TCC PWM solenoid (5).
   - 3-2 control solenoid (6).
5. Install the 1-2 accumulator. See **ACCUMULATOR ASSEMBLY** .
6. Install the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION.
7. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

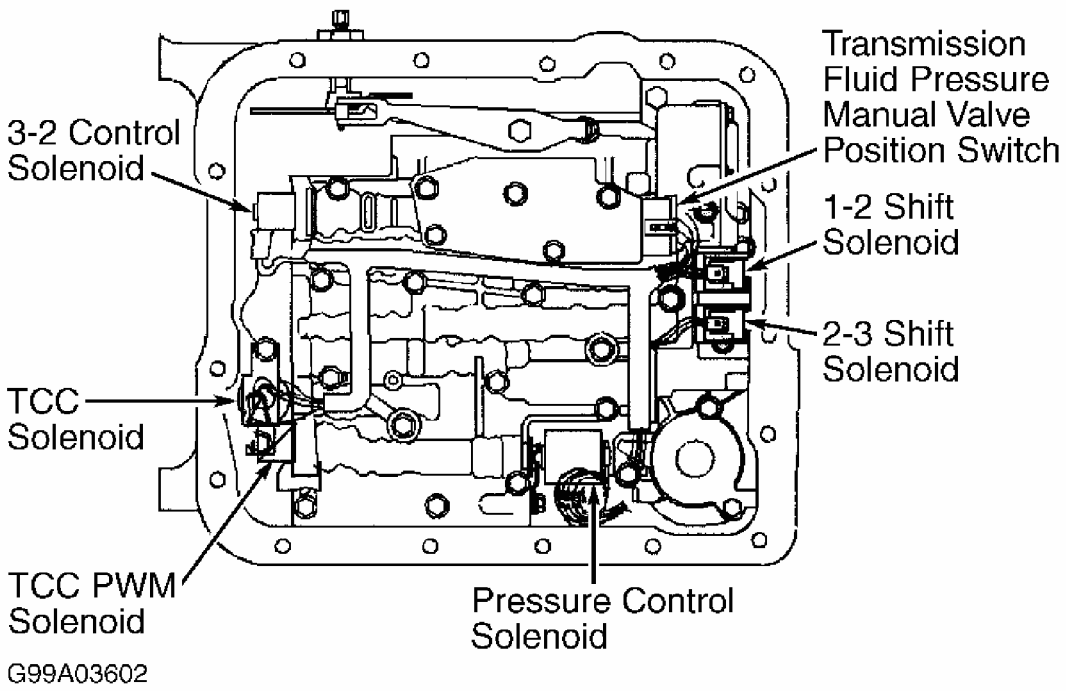

Fig. 20: View Of Control & Shift Solenoid Locations
Courtesy of GENERAL MOTORS CORP.

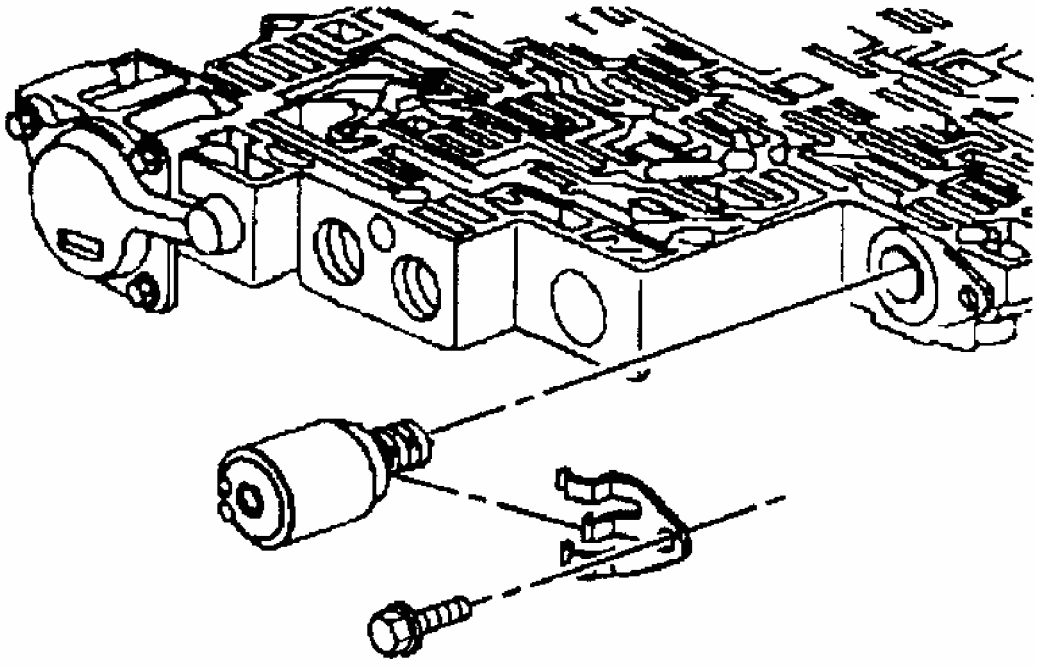

Fig. 21: Disassembled View Of Pressure Control Solenoid
Courtesy of GENERAL MOTORS CORP.

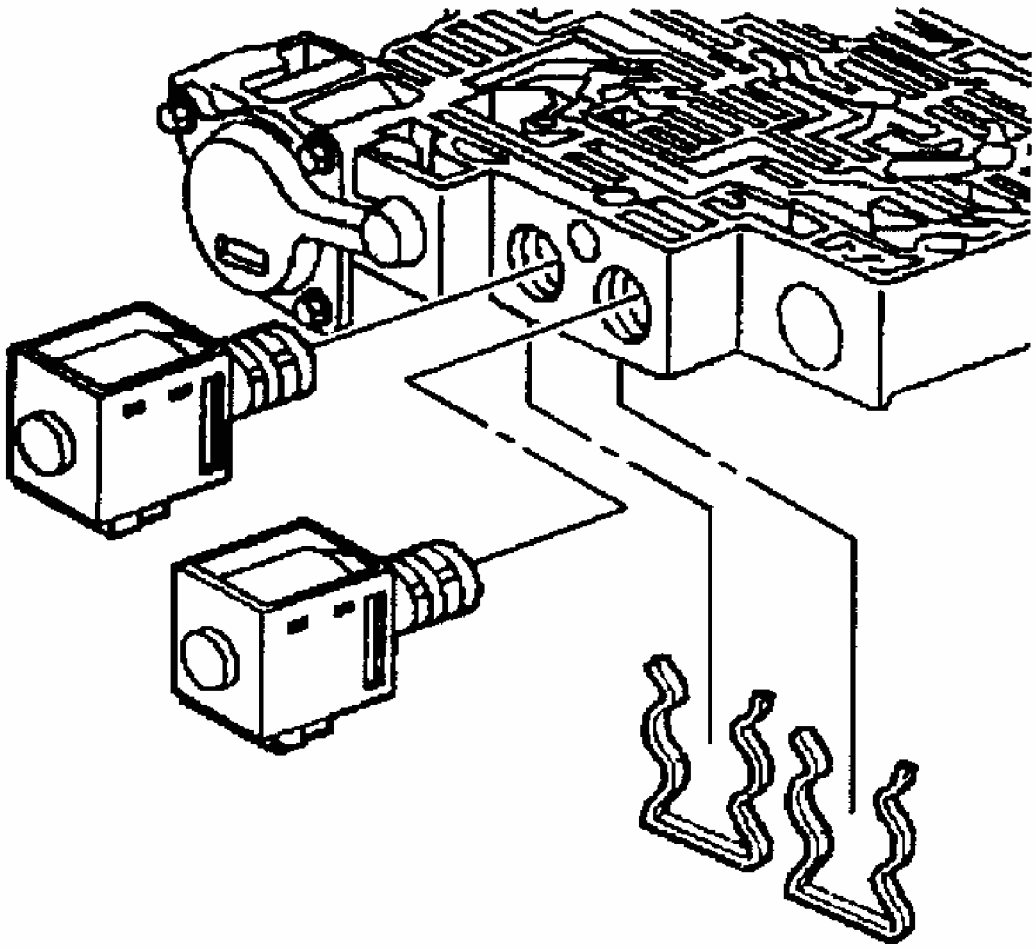

Fig. 22: Disassembled View Of Shift Solenoids

EXTENSION HOUSING REAR OIL SEAL

NOTE: Tools required: Rear Extension Seal Installer (J-21426).

Removal

Raise and support the vehicle. Remove the propeller shaft. Remove the rear extension oil seal. See **Fig. 23** .

Installation

Install the new seal using seal installer and a soft faced mallet. See **Fig. 24** . Install the propeller shaft. Lower the vehicle. Check the transmission fluid level. See **CHECKING**

FLUID LEVELS under LUBRICATION.

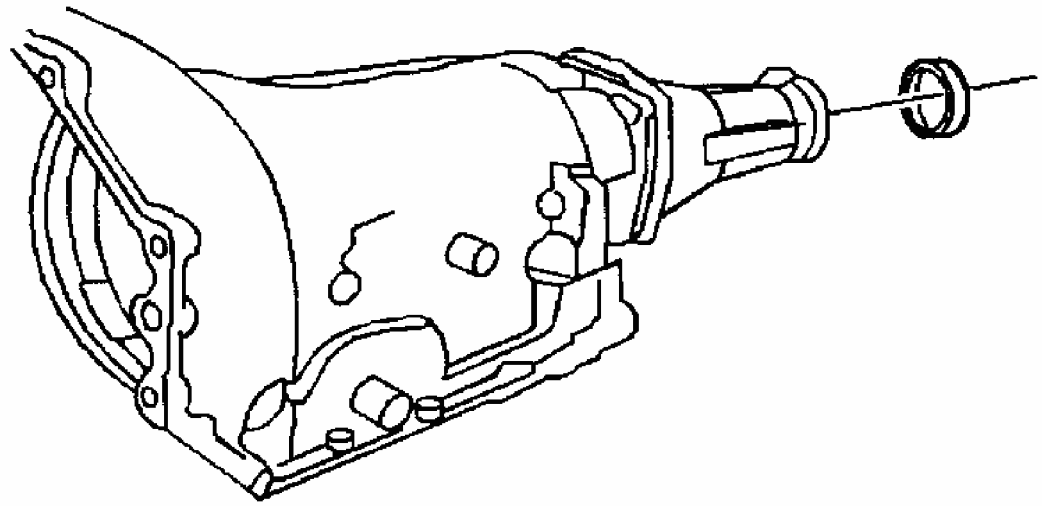

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Fig. 23: Removing Rear Extension Housing Seal
Courtesy of GENERAL MOTORS CORP.

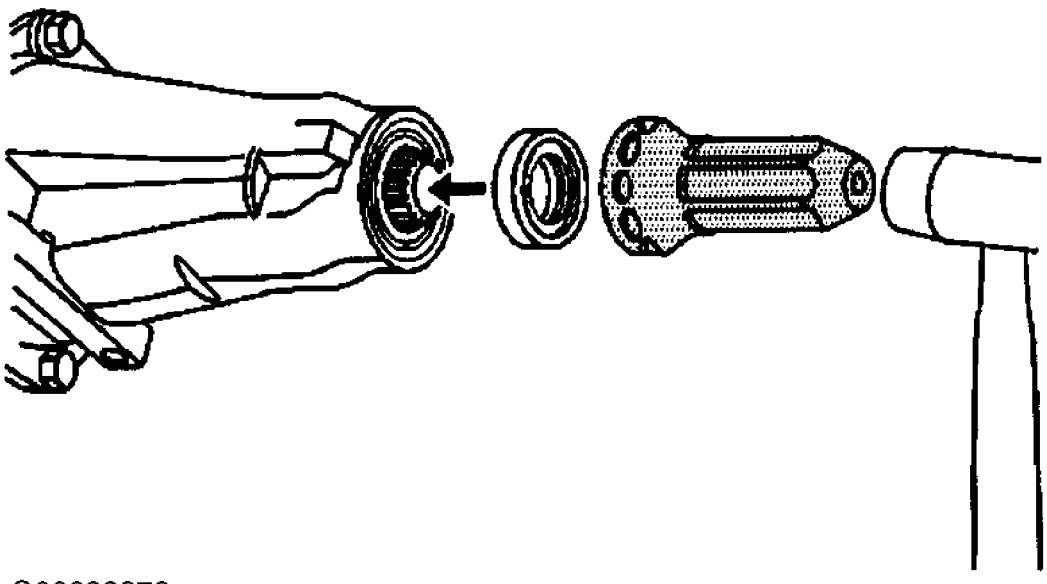

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Fig. 24: Installing Rear Extension Housing Rear Oil Seal
Courtesy of GENERAL MOTORS CORP.

FILLER TUBE

Removal

1. On 2.2L models, remove the bolt securing the dipstick to the exhaust manifold. See **Fig. 25** . On all models, remove the transmission oil level indicator.
2. Raise and support the vehicle. On 2.2L models, support the transmission and transfer case (if equipped) with a suitable jack. Remove the transmission cross member. See **Fig. 26** . On 4.3L models, remove the exhaust manifold pipe. Remove the rear propeller shaft.
3. On all models, lower the transmission to gain access and remove the filler tube-to-transmission housing bolt. Remove the filler tube and seal from the vehicle. See **Fig. 27** .

Installation

1. Install a new seal into the transmission case. Install the filler tube. Install the bolt securing the filler tube to the transmission housing. Tighten the bolt to specification. See **TORQUE SPECIFICATIONS** .
2. Raise the transmission. Install the transmission cross member and remove the jack. See **Fig. 26** . On 4.3L models, install the rear propeller shaft. Install the exhaust manifold pipe. On all models, lower the vehicle.
3. On 2.2L models, install the bolt securing the dipstick to the exhaust manifold. See **Fig. 25** . Tighten the bolt to specification. On all models, install the transmission oil level indicator. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

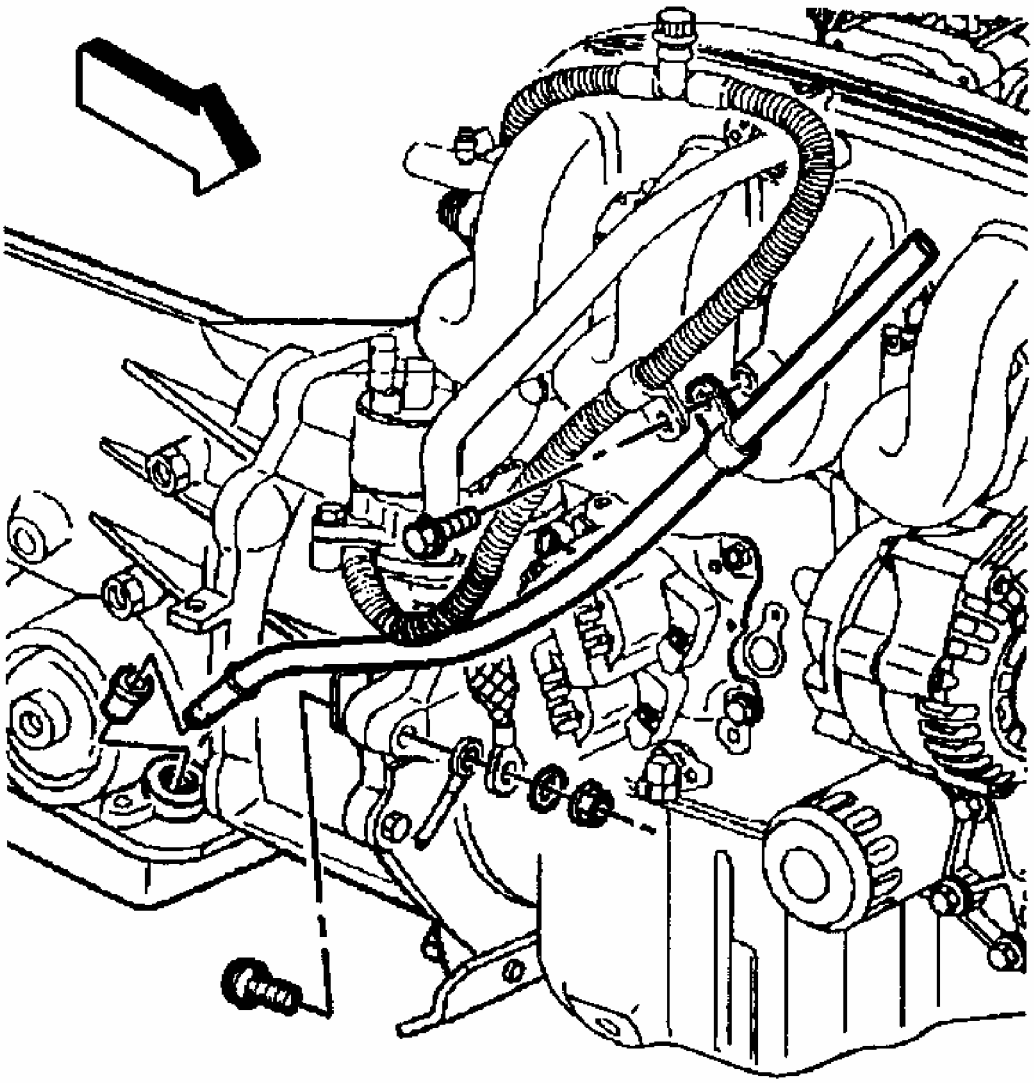

Fig. 25: Removing & Installing Mounting Bolts (2.2L)
Courtesy of GENERAL MOTORS CORP.

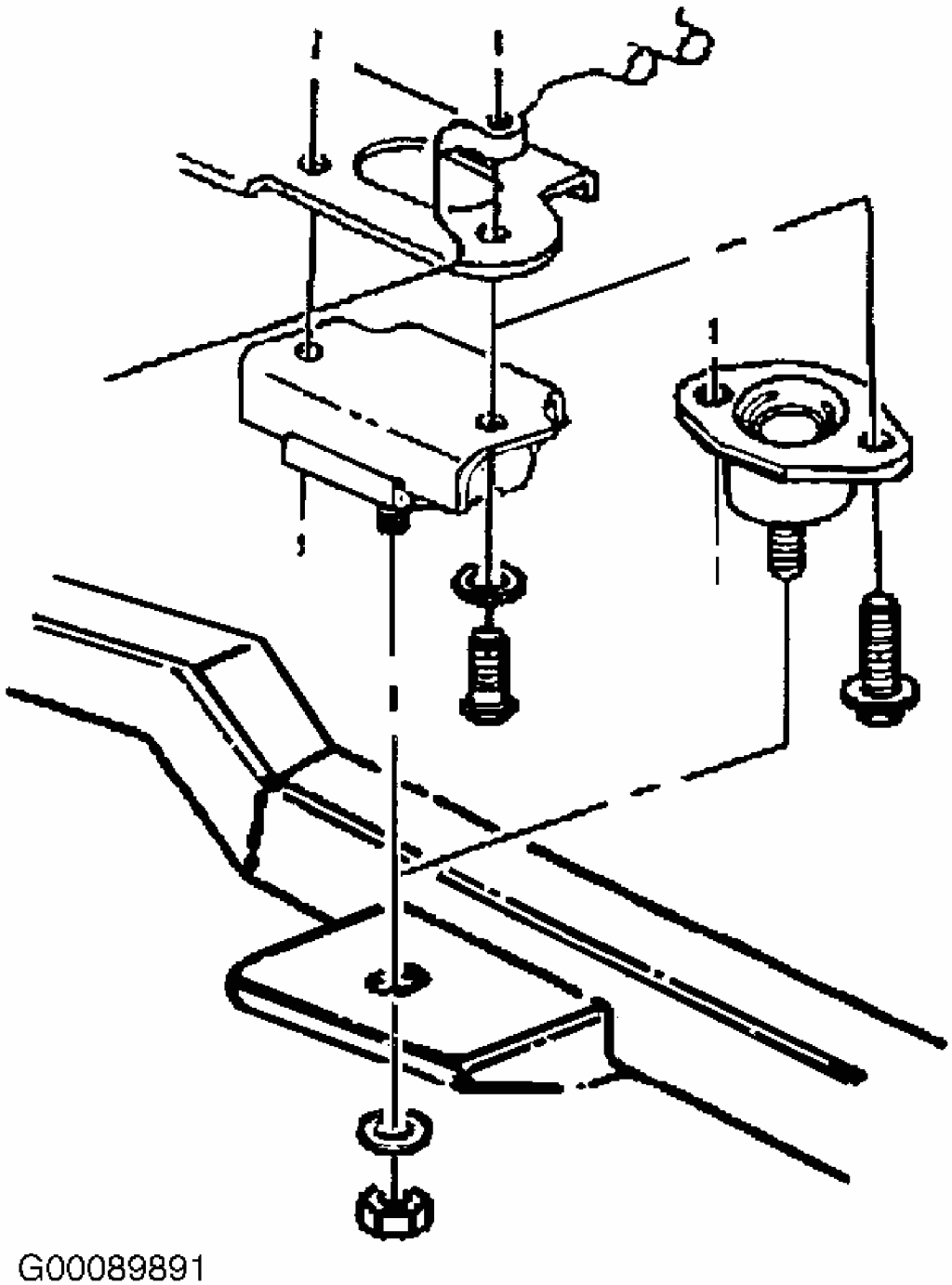

Fig. 26: Removing & Installing Crossmember Assembly
Courtesy of GENERAL MOTORS CORP.

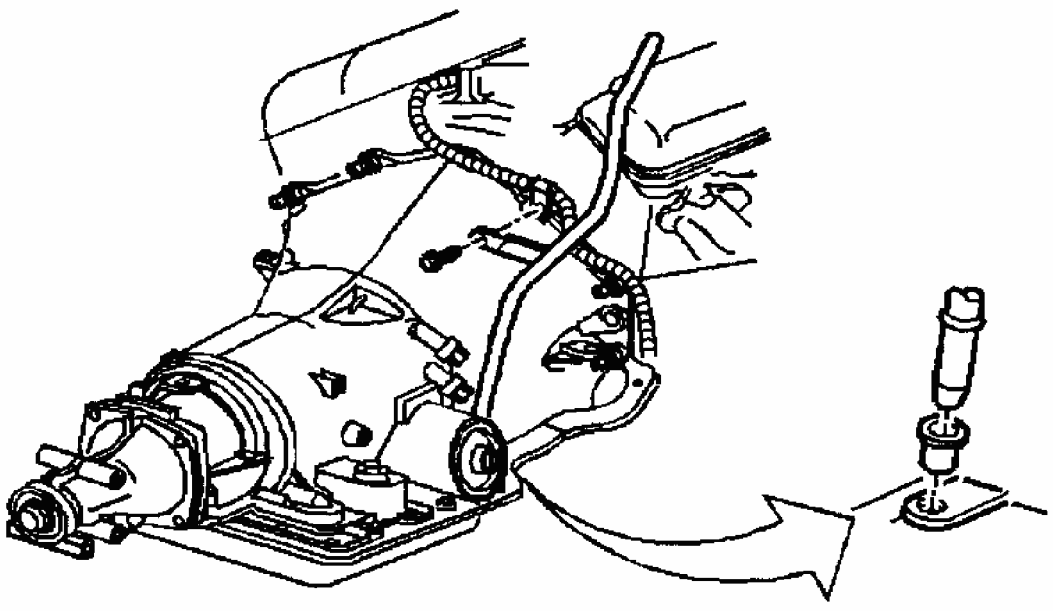

Fig. 27: Removing & Installing Filler Tube & Seal (4.3L)
Courtesy of GENERAL MOTORS CORP.

OIL COOLER LINES

Removal

NOTE: Perform the following procedure when removing the retaining rings and cooler lines from the quick connect fittings located on the radiator and/or the transmission.

1. Pull the plastic cap back from the quick connect fitting and down along the cooler line about 2" (51 mm). Using a bent-tip screwdriver, pull on one of the open ends of the retaining ring in order to rotate the retaining ring around the quick connect fitting until the retaining ring is out of position and can be completely removed. See **Fig. 28** .
2. Remove the retaining ring from the quick connect fitting. Discard the retaining ring. Pull the cooler line straight out from the quick connect fitting. See **Fig. 29** . Remove the oil cooler lines from the radiator. On 4.3L models equipped with 4WD, it may be necessary to gain access to the lower cooler line (2) through the right side wheel well opening. See **Fig. 30** .
3. On all models, raise and support the vehicle. On 2.2L models, remove the nut securing the cooling line to the engine. On 4.3L models, remove the clip and stud securing the cooler line to the engine. See **Fig. 31** .
4. On all models, support the transmission with a transmission jack. Remove the exhaust

crossover pipe and the transmission support assembly. See **Fig. 32** .

5. Carefully lower the transmission to gain access to the cooler line fittings. Remove the cooler lines from the fittings on the transmission. On 4WD models, it may be necessary to disconnect and temporarily relocate the transfer case vent hose to provide access to the fittings. On all models, remove the cooler lines from the vehicle.

Installation

1. Install the transmission oil cooler lines to the vehicle.

NOTE: Do not reuse any of the existing oil lines or oil line fittings if there is excessive corrosion. Do not reuse any of the existing retaining rings that were removed from the existing quick connect fittings. All retaining rings being installed must be new. Ensure the following procedures are performed when installing the new retaining rings onto the fittings.

2.
3. Install a new retaining ring (E-clip) into the quick connect fitting using the following procedure.
4. Hook one of the open ends of the retaining ring in one of the slots in the quick connect fitting. See **Fig. 33** . Rotate the retaining ring around the fitting until the retaining ring is positioned with all 3 ears through the 3 slots on the fitting. See **Fig. 34** .
5. DO NOT install the new retaining ring onto the fitting by pushing the retaining ring. See **Fig. 35** . Ensure that the 3 retaining ring ears are seen from inside the fitting and that the retaining ring moves freely in the fitting slots. See **Fig. 36** . Install the new retaining ring (E-clip) into the remaining quick connect fittings.

NOTE: Ensure the cooler line being installed has a plastic cap on each end that connects to a quick connect fitting. If no plastic cap exists, or the plastic cap is damaged, obtain a new plastic cap and position on to the cooler line prior to the cooler line installation.

6. Install the cooler lines to the vehicle. See **Fig. 29** . Install the cooler line into the quick connect fitting. Insert the cooler line end into the quick connect fitting until a click is either heard or felt. See **Fig. 37** .
7. DO NOT use the plastic cap on the cooler line in order to install the cooler line into the fitting. See **Fig. 38** . Pull back sharply on the cooler line in order to ensure the cooler line is fastened into the quick connect fitting. Position (snap) the plastic cap onto the fitting. See **Fig. 39** .
8. DO NOT manually depress the retaining ring when installing the plastic cap onto the quick connect fitting. Ensure the plastic cap is fully seated against the fitting. See **Fig.**

39 .

9. Ensure that no gap is present between the cap and the fitting. See **Fig. 40** . Ensure the Yellow identification band on the tube is hidden within the quick connect fitting. A hidden Yellow identification band indicates proper joint seating. See **Fig. 39** . Install all remaining cooling line ends to the remaining fittings.
10. Install the transfer case vent hose, if equipped. Raise the transmission into position. Install the exhaust crossover pipe and the transmission support assembly. Remove the transmission jack.
11. On 4.3L models, install the stud and clip securing the cooler line to the engine. Tighten the stud to specification. See **TORQUE SPECIFICATIONS** .
12. On 2.2L models, install the nut securing the oil cooler lines to the engine. Tighten the nut to specification. See **TORQUE SPECIFICATIONS** .
13. On all models, lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

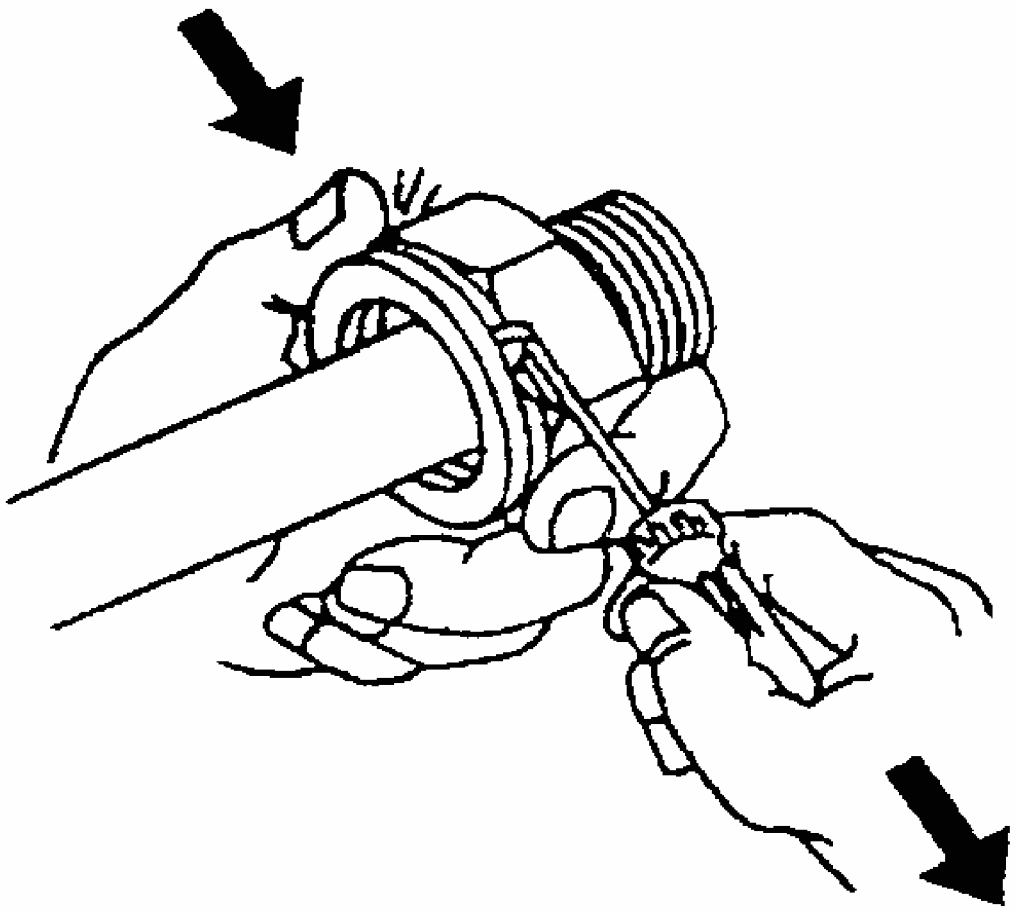

Fig. 28: Removing Retaining Ring
Courtesy of GENERAL MOTORS CORP.

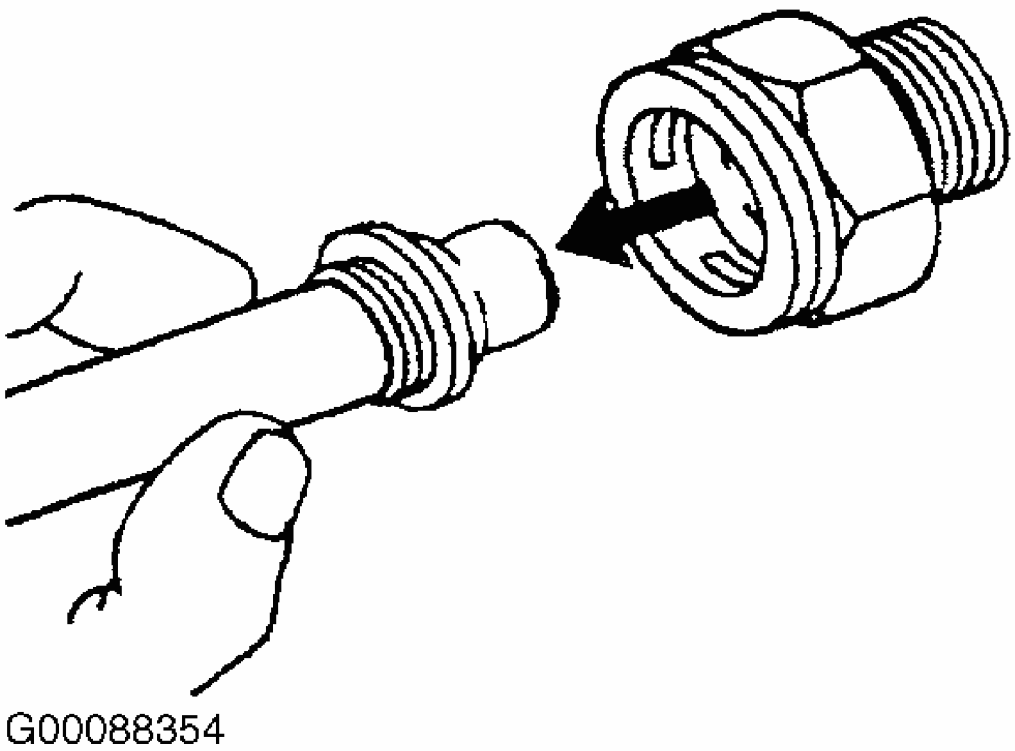

Fig. 29: Removing & Installing Cooler Line From Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

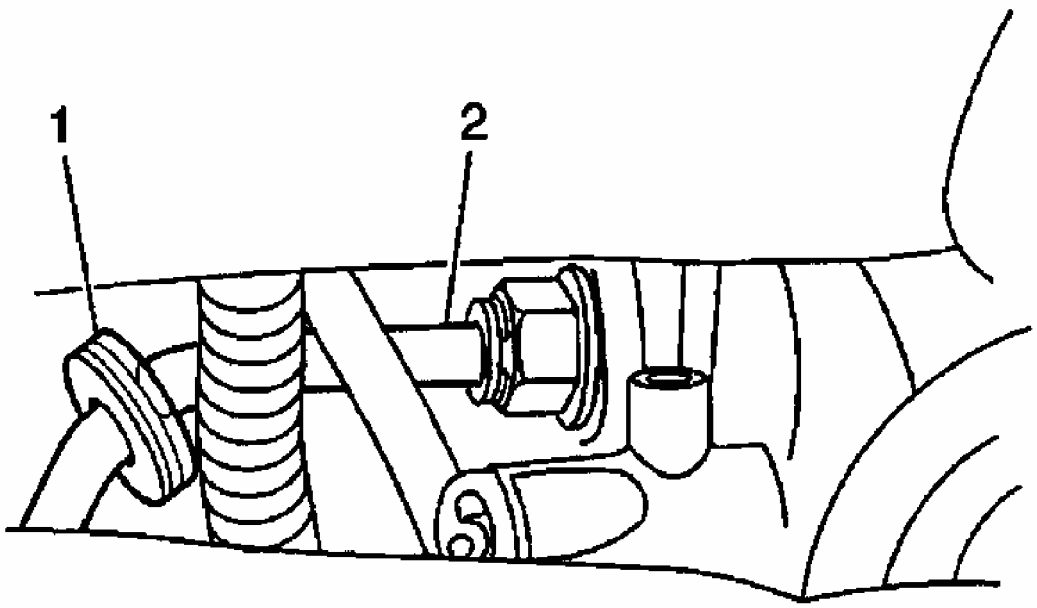

Fig. 30: Removing & Installing Cooler Lines At Radiator
Courtesy of GENERAL MOTORS CORP.

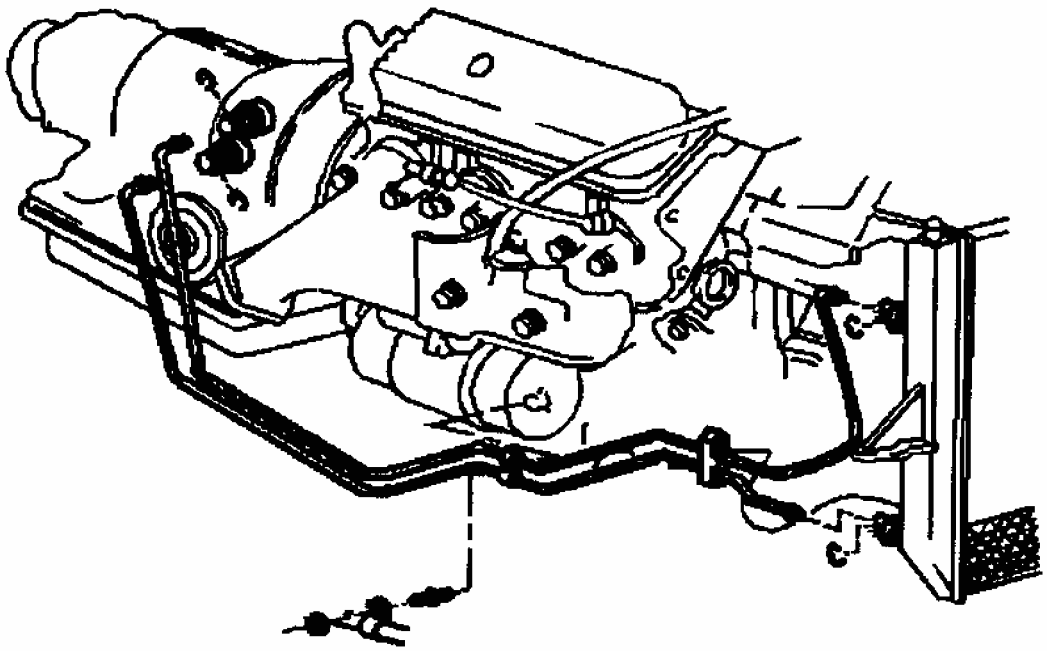

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Fig. 31: View Of Cooler Lines
Courtesy of GENERAL MOTORS CORP.

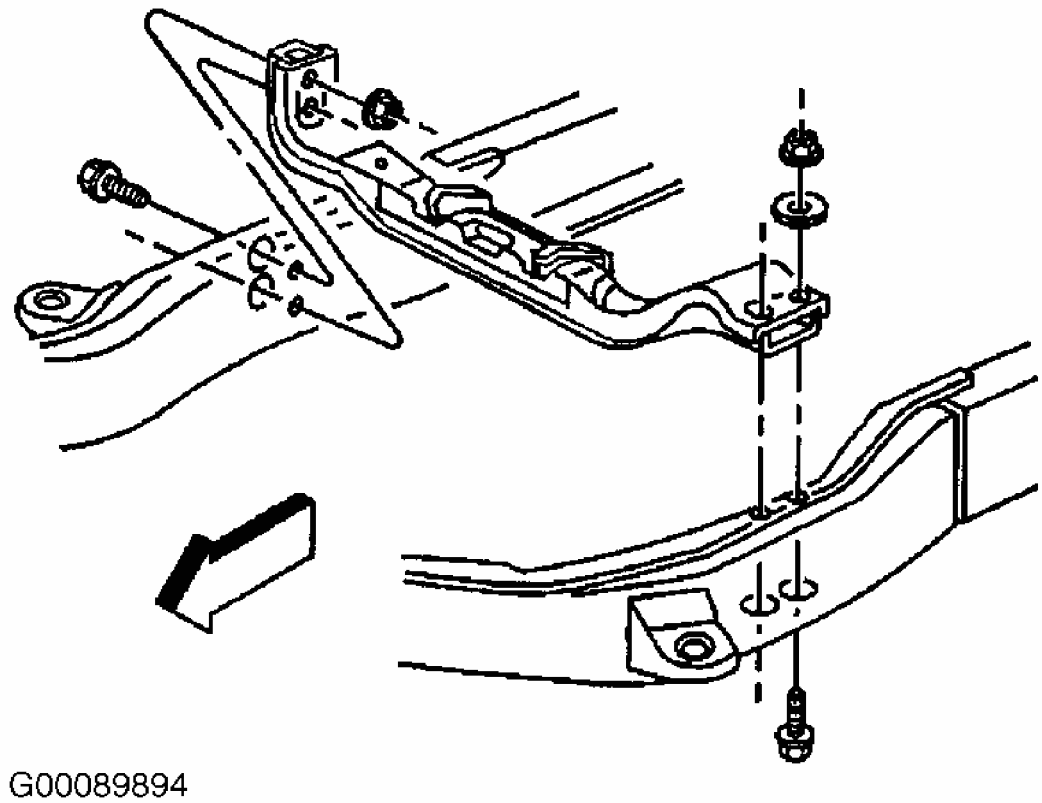

Fig. 32: Removing & Installing Transmission Cross Member
Courtesy of GENERAL MOTORS CORP.

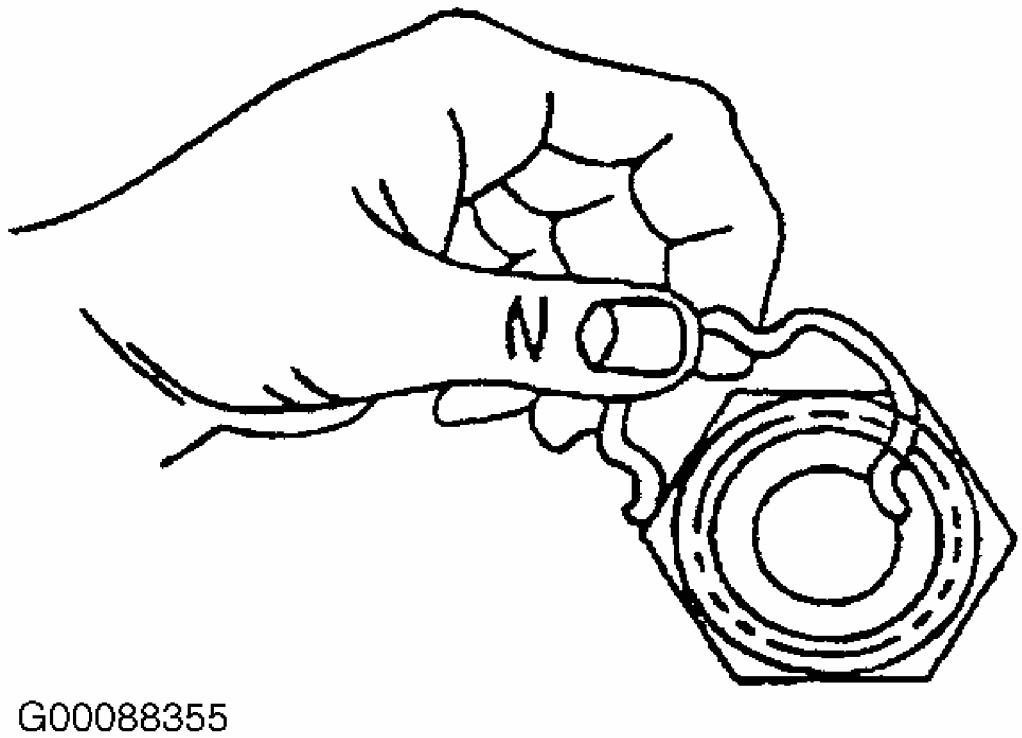

Fig. 33: Starting Retaining Ring Onto Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

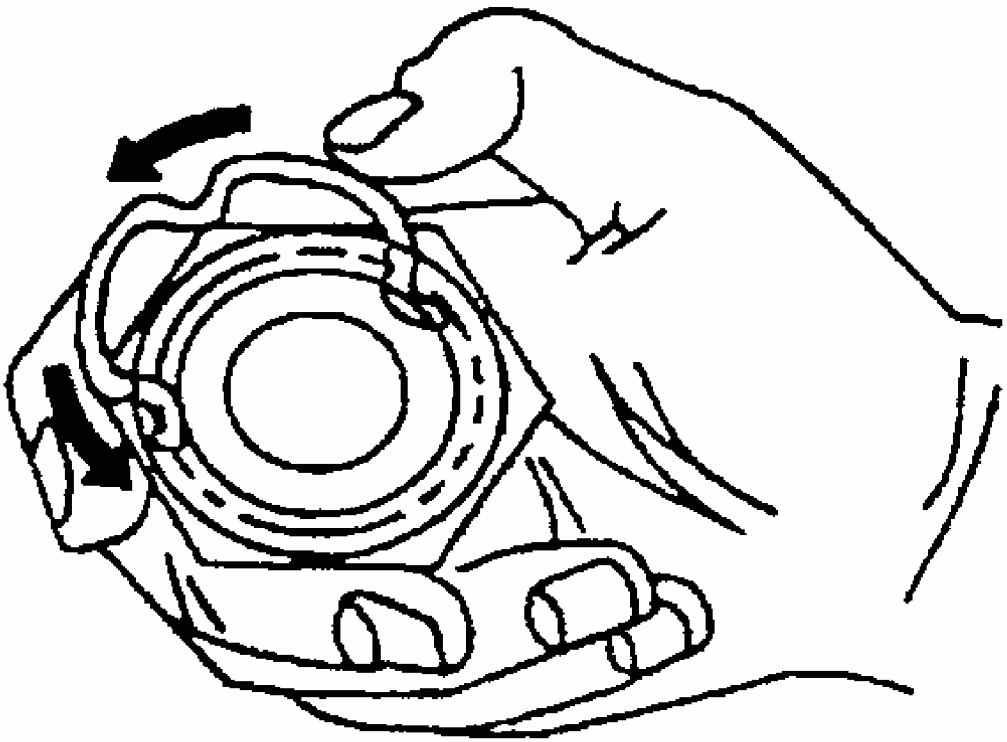

Fig. 34: Installing Retaining Ring On Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

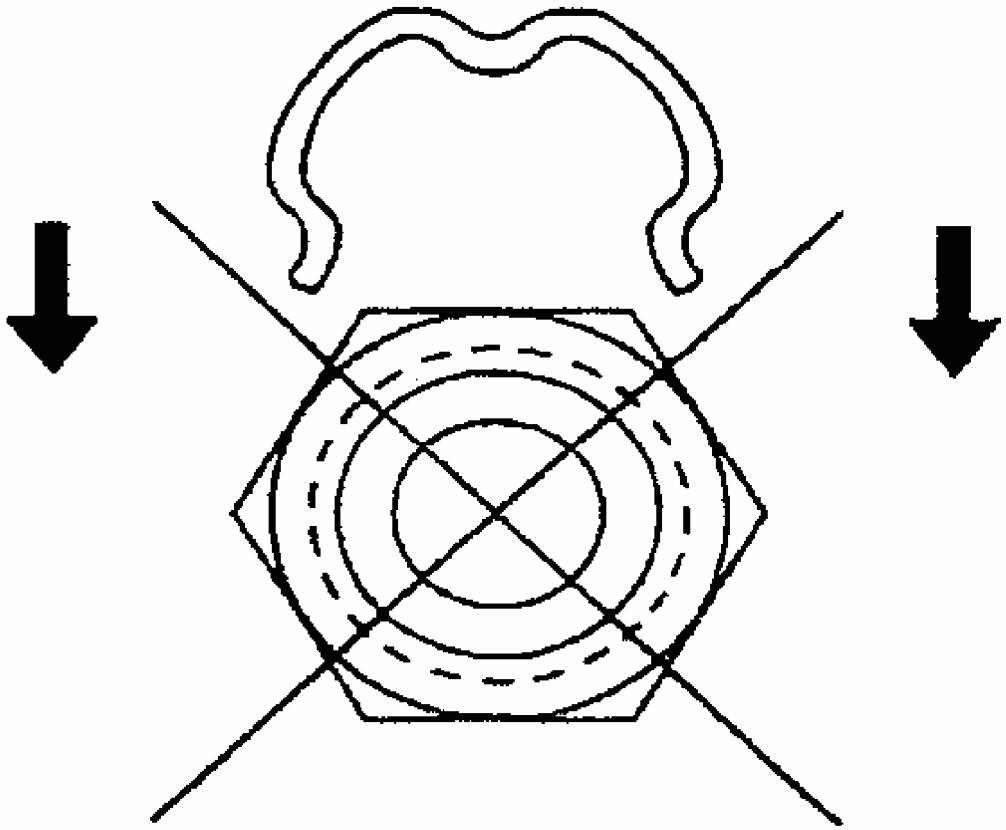

Fig. 35: View Of Incorrect Method Of Installing Retainer Ring
Courtesy of GENERAL MOTORS CORP.

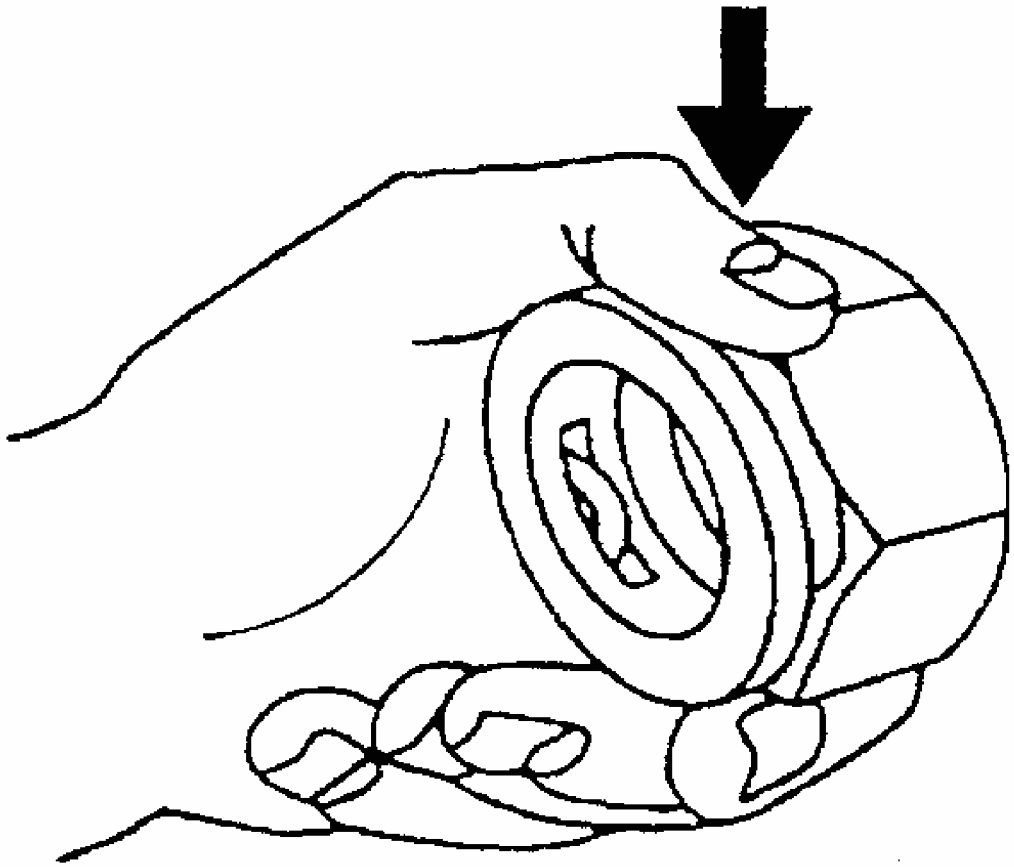

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Fig. 36: View Of Correctly Installed Retainer Ring
Courtesy of GENERAL MOTORS CORP.

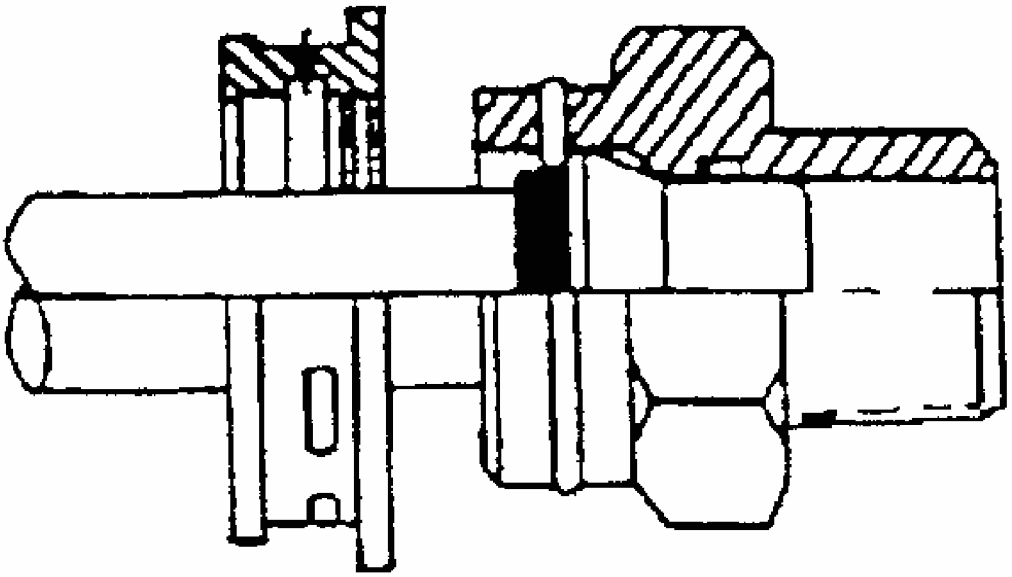

Fig. 37: Installing Cooler Lines To Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

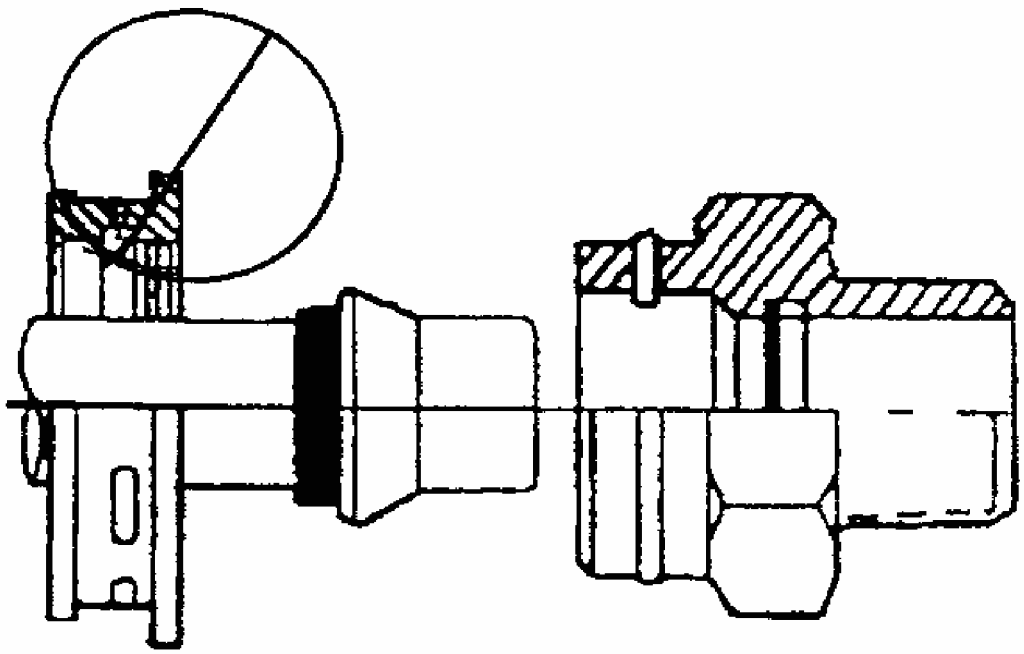

Fig. 38: Incorrect Installation Method Using Plastic Cap To Install
Courtesy of GENERAL MOTORS CORP.

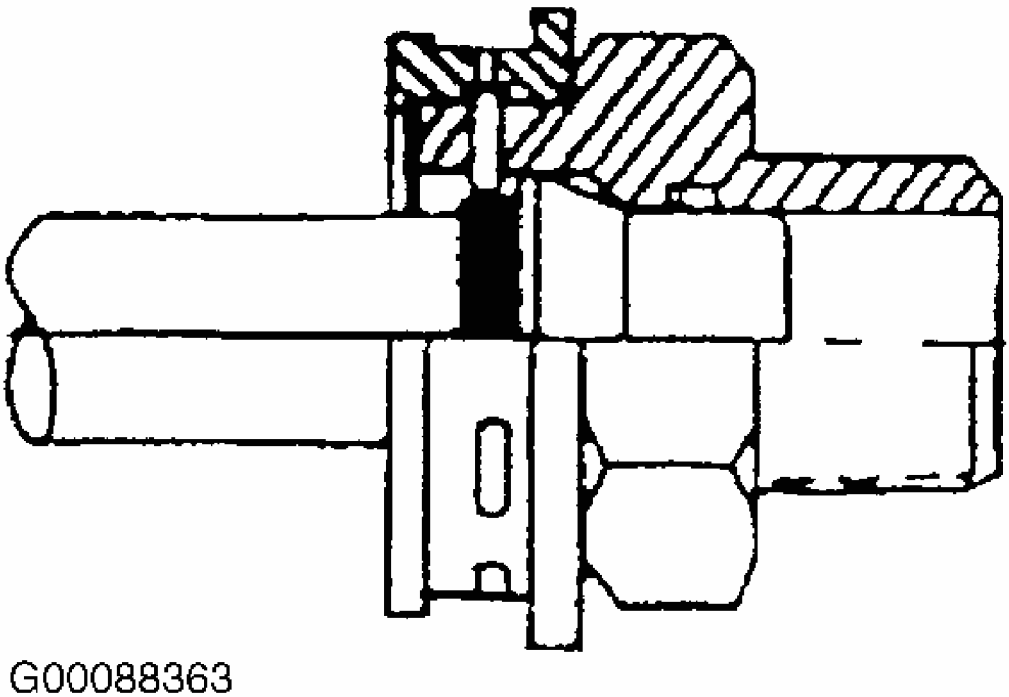

Fig. 39: Installed View Of Quick Connect Fitting
Courtesy of GENERAL MOTORS CORP.

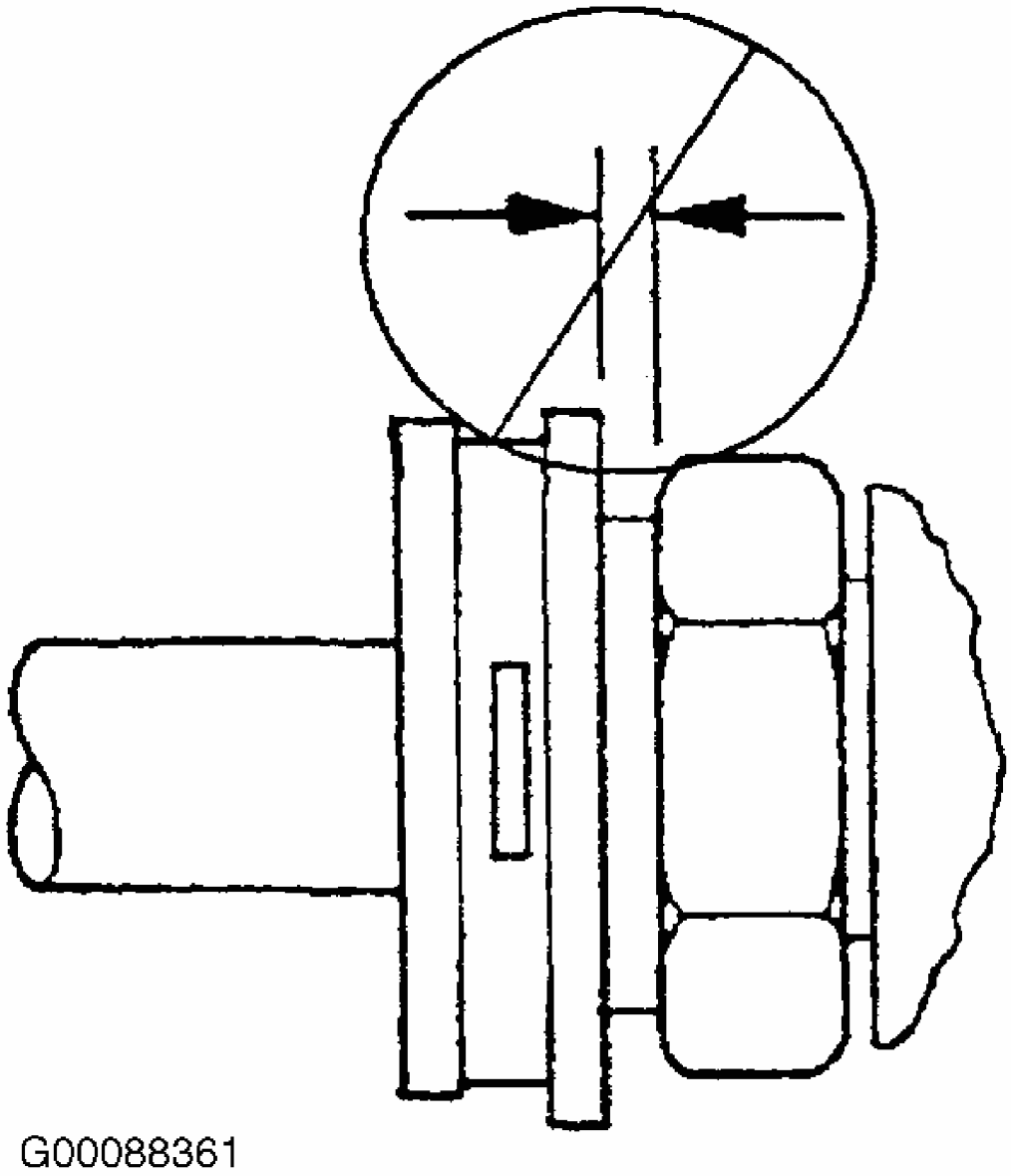

Fig. 40: Checking For Improper Gap
Courtesy of GENERAL MOTORS CORP.

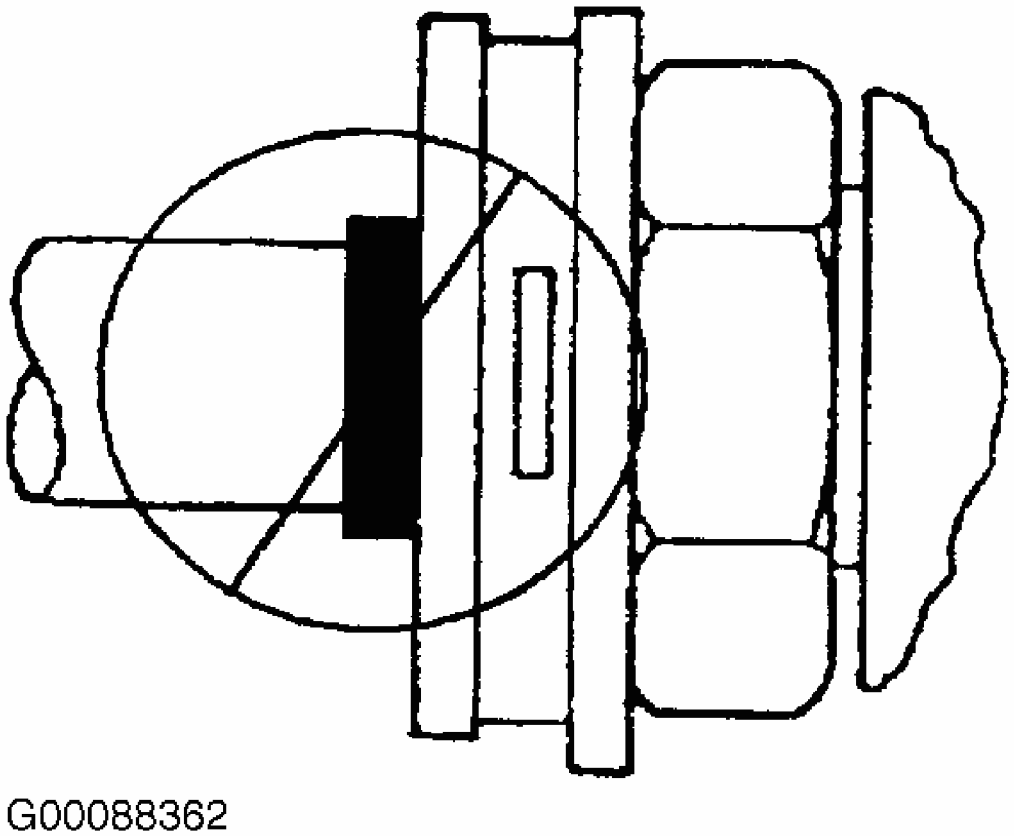

Fig. 41: Checking For Identification Band
Courtesy of GENERAL MOTORS CORP.

PARK/NEUTRAL POSITION SWITCH

NOTE: Tools required: Neutral Position Adjustment Tool (J-41364-A).

Removal

1. Apply the parking brake. Shift the transmission into Neutral. Raise and support the vehicle. Remove nut securing transmission control lever to manual shaft. Remove transmission control lever from manual shaft. Disconnect electrical connectors from switch.
2. Remove bolts securing PNP switch to transmission. Remove PNP switch from manual shaft. See **Fig. 42** . If PNP switch did not slide off manual shaft, file outer edge of manual shaft to remove any burrs.

Installation

1. Install switch to transmission manual shaft by aligning switch hub flats with manual shaft flats. Slide switch onto transmission manual shaft until switch mounting bracket contacts mounting bosses on transmission. See **Fig. 42** .
2. Install the switch to the transmission with 2 bolts finger tight. DO NOT tighten the bolts at this time. Position the adjustment tool onto the PNP switch. See **Fig. 43** . Ensure the 2 slots on the switch where the manual shaft is inserted are lined up with the lower 2 tabs on the tool. Rotate the tool until the upper locator pin on the tool is lined up with the slot on the top of the switch.
3. Tighten the bolts securing the switch to specification. See **TORQUE SPECIFICATIONS** . Remove the alignment tool from the switch. Connect the electrical connectors to the switch. Install the transmission control lever to the manual shaft with the nut. Tighten the control lever nut to specification. See **TORQUE SPECIFICATIONS** .
4. Lower the vehicle. Check the switch for proper operation. The engine must start in the PARK or NEUTRAL positions only. If proper operation of the switch cannot be obtained, replace the switch.

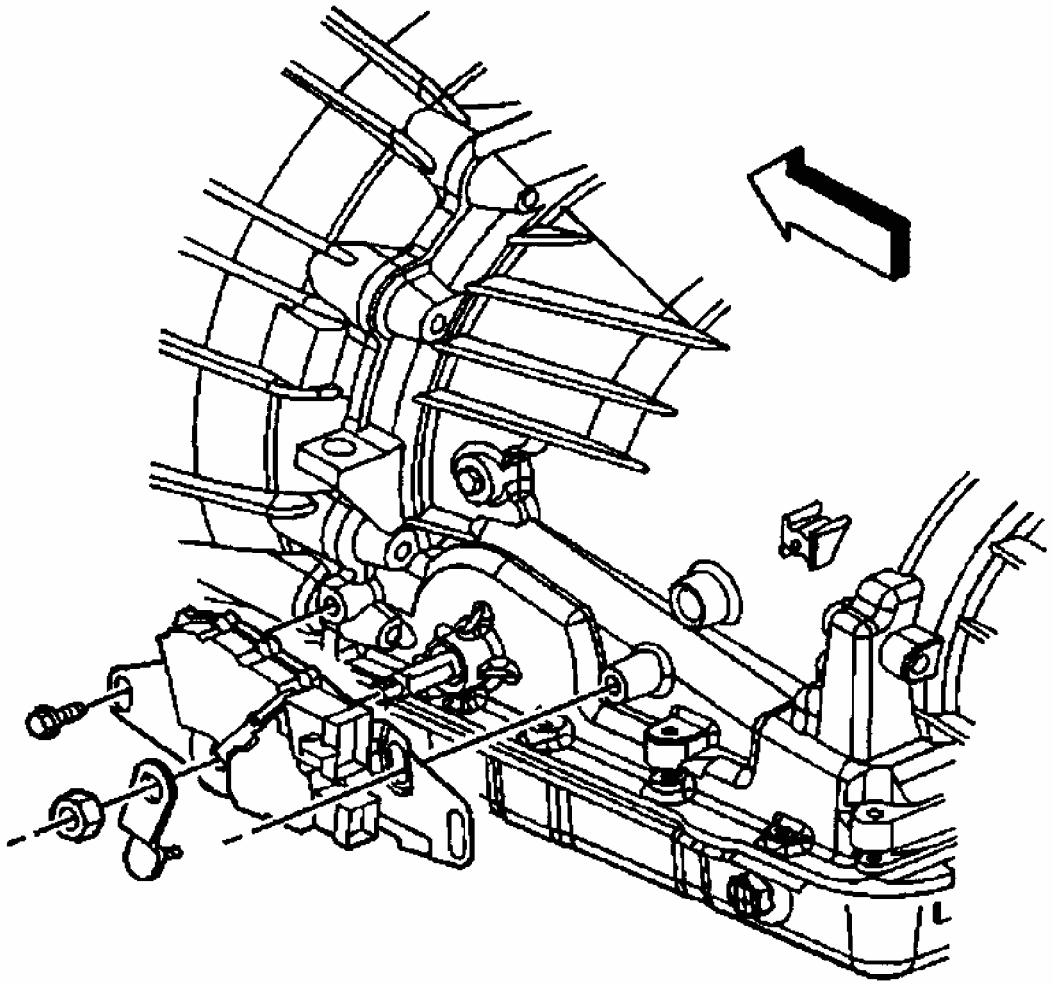

Fig. 42: Removing & Installing PNP Switch
Courtesy of GENERAL MOTORS CORP.

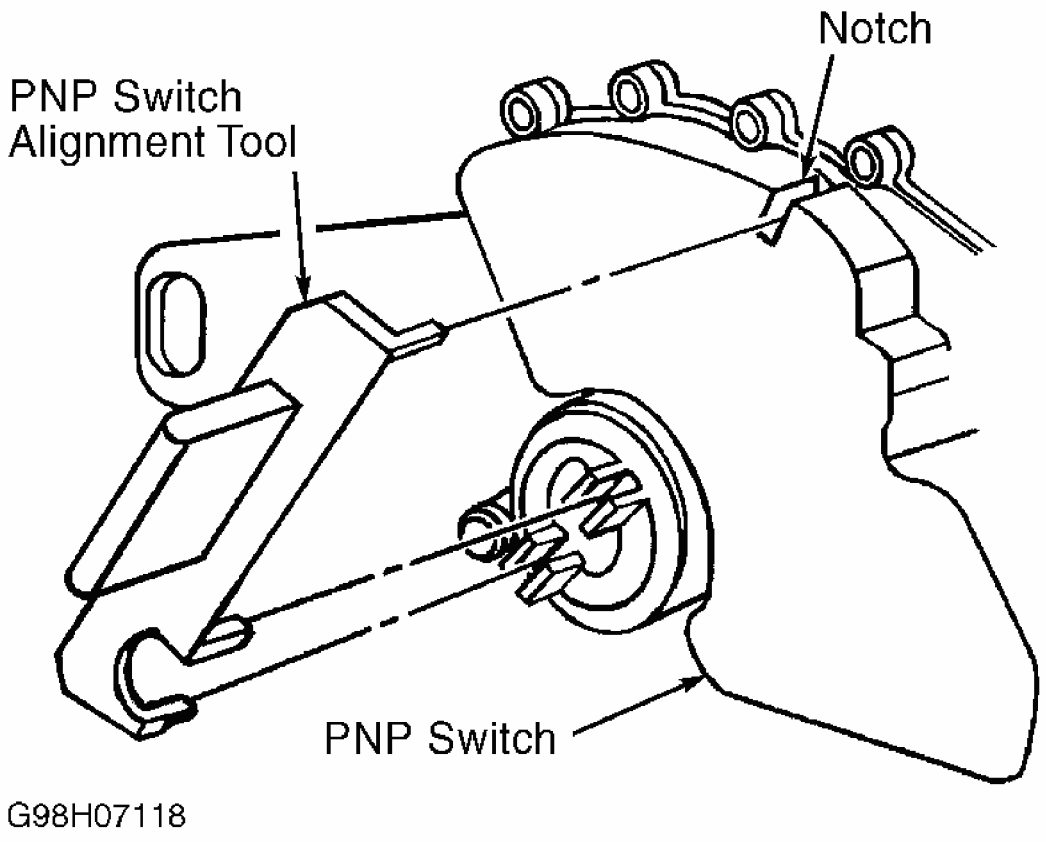

Fig. 43: Using (J-41364-A) To Adjust PNP Switch
Courtesy of GENERAL MOTORS CORP.

PRESSURE REGULATOR

Removal

1. Raise and support the vehicle. Remove the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION.
2. Compress the reverse boost valve sleeve into the bore of the oil pump to release tension on the reverse boost valve retaining ring. See **Fig. 44** .
3. Remove the reverse boost valve retaining ring, then slowly release tension on the reverse boost valve sleeve.
4. Remove the reverse boost valve sleeve (5) and the reverse boost valve (4). See **Fig. 45** .
5. Remove the pressure regulator isolator spring (3) and the pressure regulator valve spring (2). Remove the pressure regulator valve (1). See **Fig. 45** .

Installation

1. Install the pressure regulator valve (1). Install the pressure regulator isolator spring (3) and the pressure regulator valve spring (2). See **Fig. 45** .
2. Install the reverse boost valve (4) in the reverse boost valve sleeve (5). Install the reverse boost valve (4) and sleeve (5) in the oil pump cover. See **Fig. 45** .
3. Compress the reverse boost valve sleeve into the bore of the oil pump to expose the retaining ring slot.
4. Install the reverse boost valve retaining ring, then slowly release tension on the reverse boost valve sleeve. See **Fig. 44** . Install the transmission oil filter and pan. See **DRAINING & REFILLING** under LUBRICATION.
5. Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

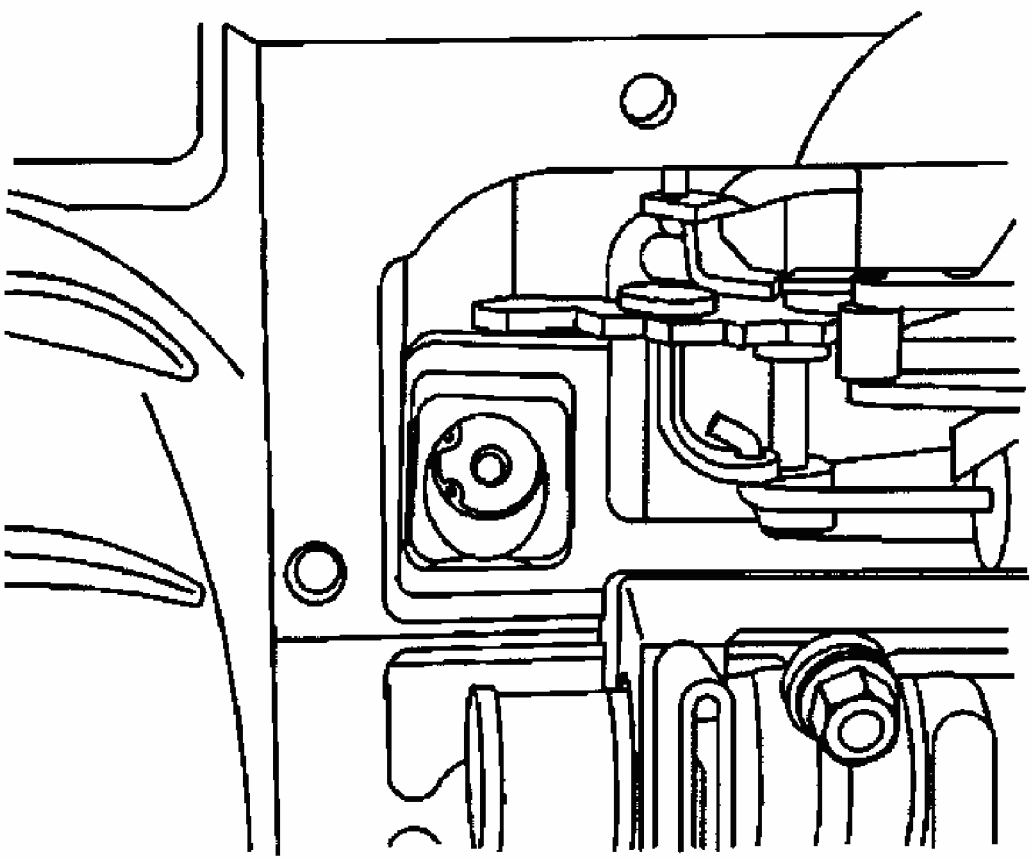

Fig. 44: Installed View Of Pressure Regulator
Courtesy of GENERAL MOTORS CORP.

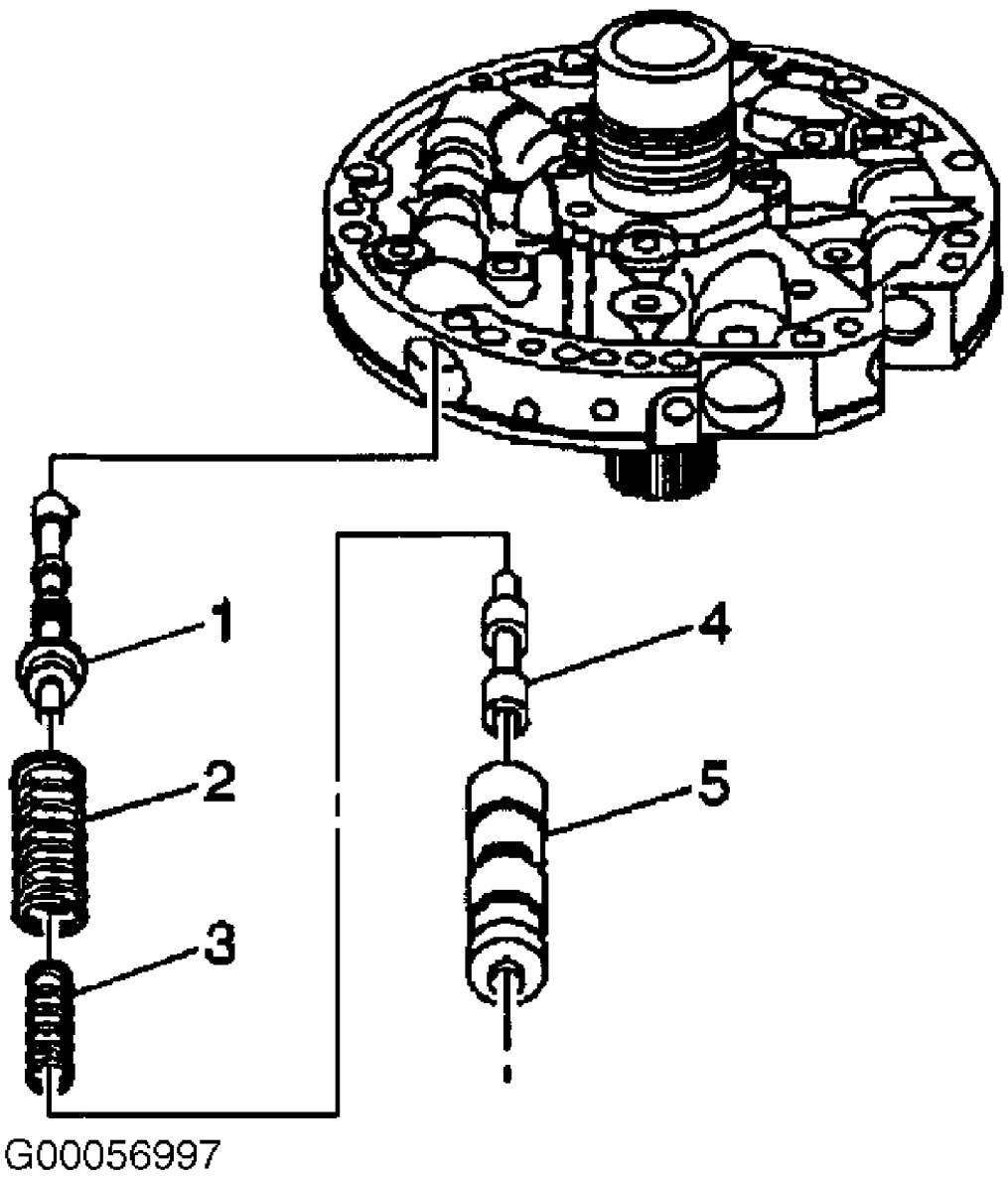

Fig. 45: Exploded View Of Pressure Regulator
Courtesy of GENERAL MOTORS CORP.

SHIFT CABLE

Removal

1. Apply parking brake and block wheels. Remove the left front mat and carpet as necessary. Remove the console. See appropriate SHIFT INTERLOCK SYSTEMS article in AUTOMATIC TRANSMISSIONS.

2. Ensure the transmission is in the mechanical Neutral position. Remove the retainer securing the shift cable to the shift controller. See **Fig. 46** .
3. Remove the tape and grommet on the shift cable from the floor panel. See **Fig. 47** .
4. Raise and support the vehicle. Remove the retainer from the shift cable and transmission bracket. See **Fig. 48** . Remove the shift cable end from the transmission shift lever stud ball. Remove the cable from the vehicle.

Installation

1. Ensure the transmission is in the mechanical Neutral position. Following the shift cable adjustment procedure, install the shift cable end of the shift cable to the transmission shift lever stud ball. See **SHIFT CABLE** under ADJUSTMENTS.
2. Install the retainer to the shift cable and transmission bracket. Feed the shift cable through the floor panel. See **Fig. 47** . Lower the vehicle.
3. Install the tape and grommet on the shift cable to the floor panel. Install the retainer securing the shift cable to the shift controller. See **Fig. 46** .
4. Install the console. See appropriate SHIFT INTERLOCK SYSTEMS article in AUTOMATIC TRANSMISSIONS. Install the front mat and carpet.

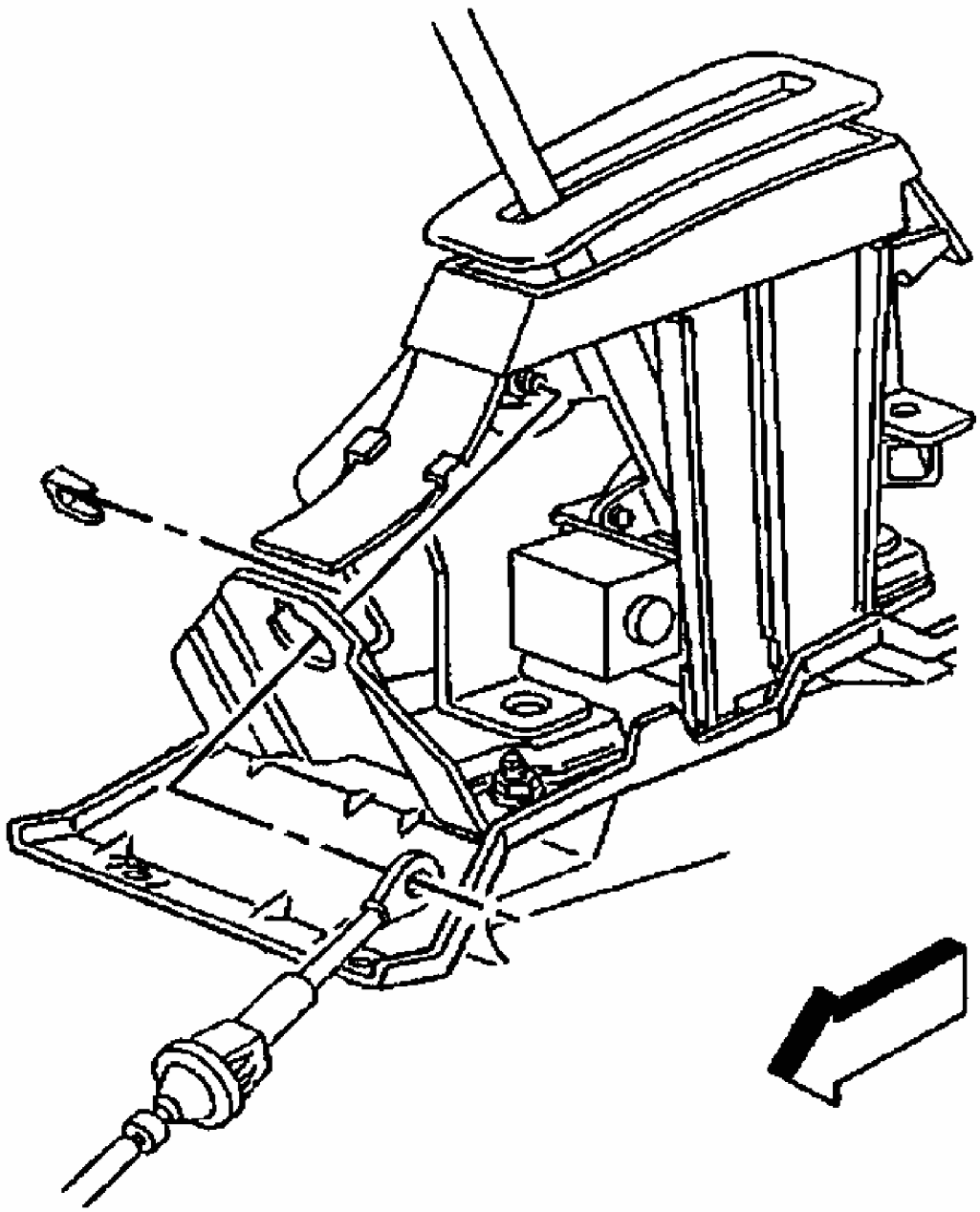

Fig. 46: Removing & Installing Cable At Floor Shift Assembly
Courtesy of GENERAL MOTORS CORP.

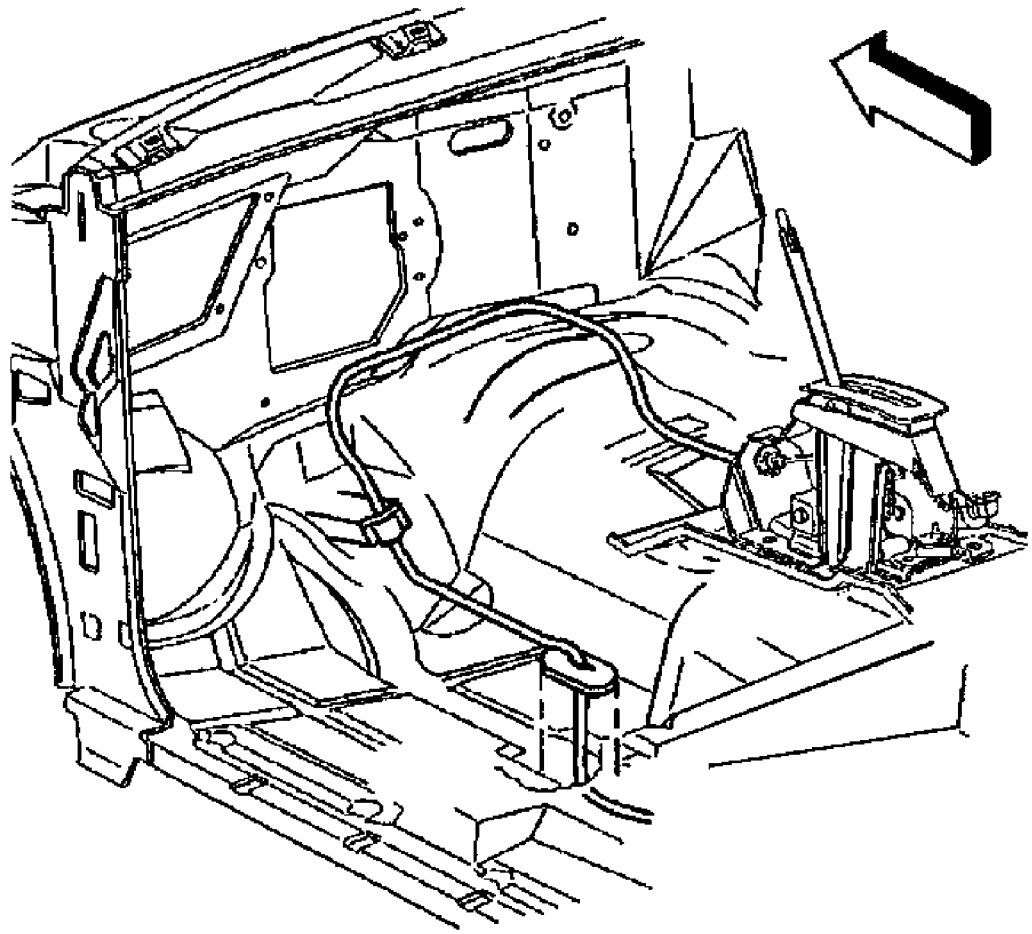

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Fig. 47: Shift Cable Routing Under Carpet
Courtesy of GENERAL MOTORS CORP.

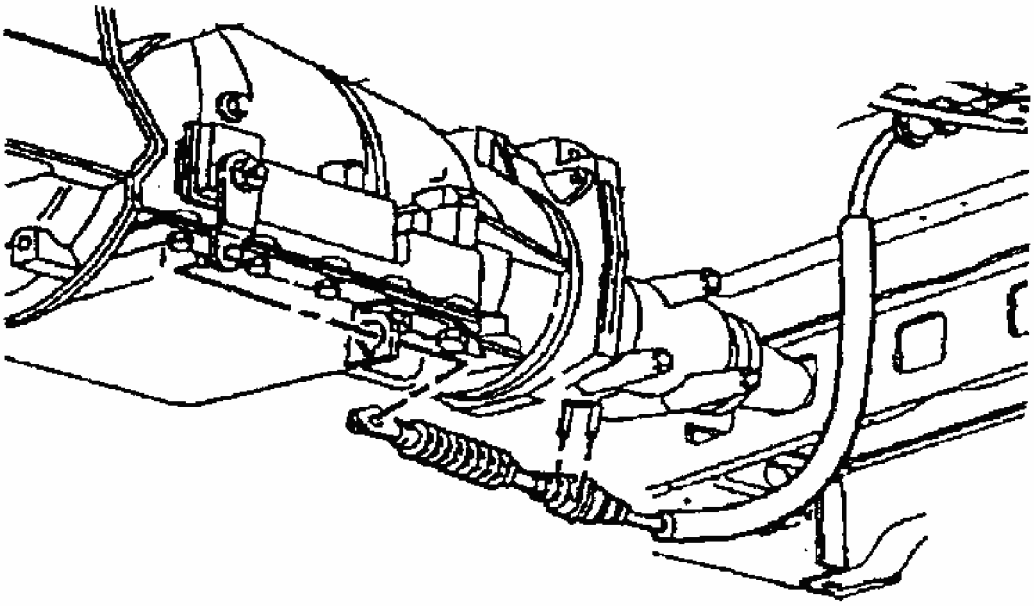

Fig. 48: Identifying Shift Cable Location & Routing
Courtesy of GENERAL MOTORS CORP.

TCC SOLENOID, TCC PWM SOLENOID & WIRING HARNESS

NOTE: Tools required: Seal Protector Retainer Installer (J-28458).

Removal

1. Raise and support the vehicle. Remove the transmission oil pan and the filter. See **DRAINING & REFILLING** under LUBRICATION.
2. Disconnect the transmission harness 20-way connector from the transmission internal harness pass-through connector. See **Fig. 49** . Depress both tabs on the connector and pull straight up, do not pry the connector.
3. Remove the 1-2 accumulator assembly. See **ACCUMULATOR ASSEMBLY** .
4. Disconnect the internal wiring harness electrical connectors from the following components: transmission fluid pressure switch (1), 1-2 shift control solenoid (2), 2-3 shift control solenoid (3), pressure control solenoid (4), TCC PWM solenoid (5) and 3-2 control solenoid (6). See **Fig. 20** .
5. Remove the TCC PWM solenoid retainer. Remove the TCC PWM solenoid to access one of the TCC solenoid retaining bolts. See **Fig. 50** .
6. Remove the pressure control solenoid retainer. Remove the pressure control solenoid.

See **Fig. 21** . Remove the TCC solenoid retaining bolts and the valve body bolts which retain the internal wiring harness. See **Fig. 51** .

7. Using the seal protector retainer installer, release the pass-through electrical connector from the transmission case. See **Fig. 52** . Use the small end of the tool over the top of the connector. Twist to release the 4 tabs retaining the connector. Pull the harness connector down through the transmission case.
8. Remove the TCC solenoid (with O-ring seal) and wiring harness assembly from the transmission case.
9. Inspect the TCC solenoid and wiring harness assembly for the following defects: damage/cracked connectors, exposed wires and loose pins. See **Fig. 53** .

Installation

1. Install the wiring harness and TCC solenoid assembly with a new O-ring seal to the transmission. Install the pass-through electrical connector to the transmission case. See **Fig. 52** .
2. Install the valve body bolts which retain the internal wiring harness and install the TCC solenoid retaining bolts. See **Fig. 51** . Tighten the control valve body retaining bolts to specification. See **TORQUE SPECIFICATIONS** .
3. Tighten the TCC solenoid retaining bolts to specification. See **TORQUE SPECIFICATIONS** .
4. Install the pressure control solenoid. See **Fig. 21** . Ensure the electrical tabs are facing outboard. Install the pressure control solenoid retainer and retaining bolt. Tighten the pressure control solenoid retaining bolt to specification. See **TORQUE SPECIFICATIONS** .
5. Install the TCC PWM solenoid to the control valve body. See **Fig. 50** . Install the TCC PWM solenoid retainer.
6. Connect the internal wiring harness electrical connectors to the following components: transmission fluid pressure switch (1), 1-2 shift control solenoid (2), 2-3 shift control solenoid (3), pressure control solenoid (4), TCC PWM solenoid (5) and 3-2 control solenoid (6). Install the 1-2 accumulator. See **Fig. 20** .
7. Connect the transmission harness 20-way connector to the transmission pass-through connector. Align the arrows on each half of the connector and insert straight down. See **Fig. 49** .
8. Install the transmission oil pan and filter. See **DRAINING & REFILLING** under LUBRICATION. Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

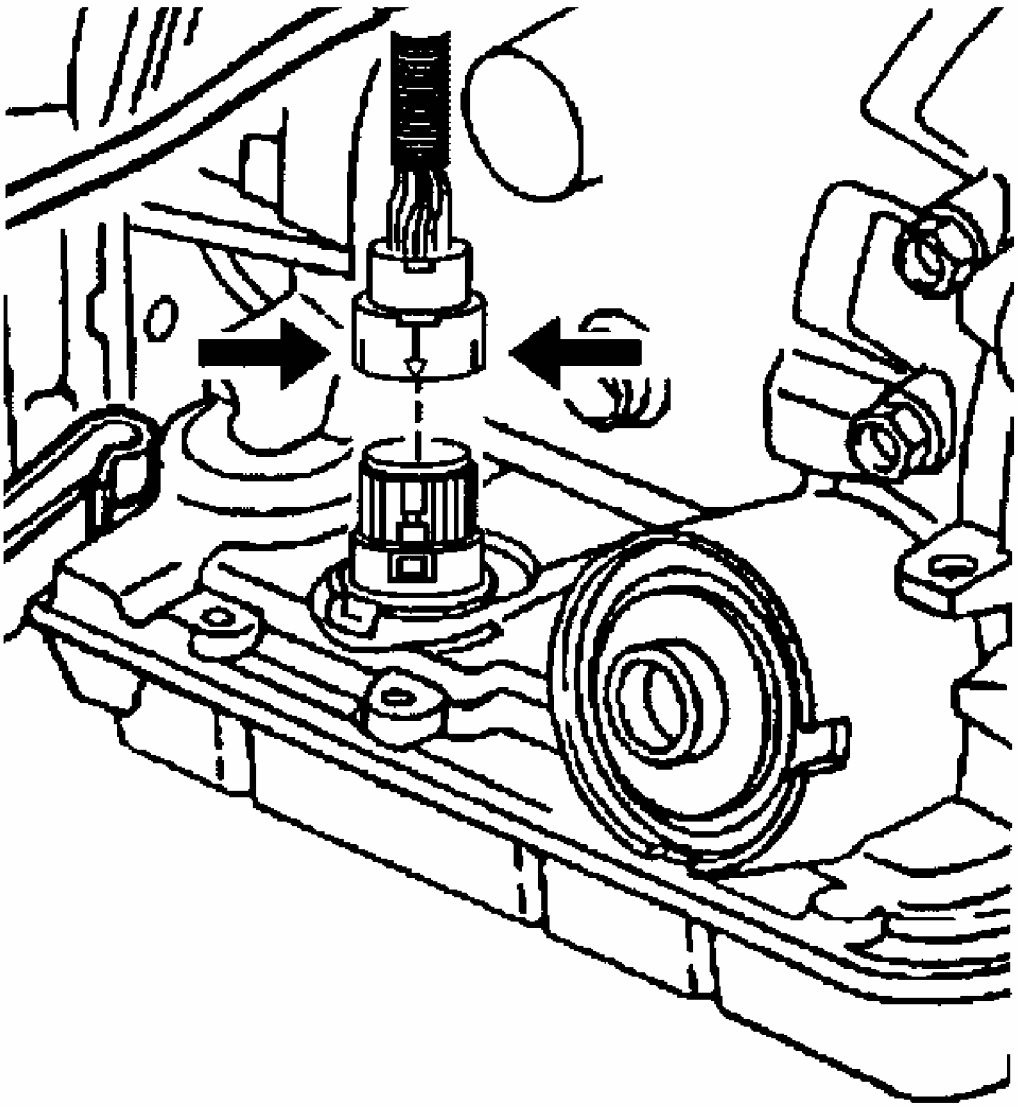

Fig. 49: Disconnecting & Connecting Transmission Harness Connector
Courtesy of GENERAL MOTORS CORP.

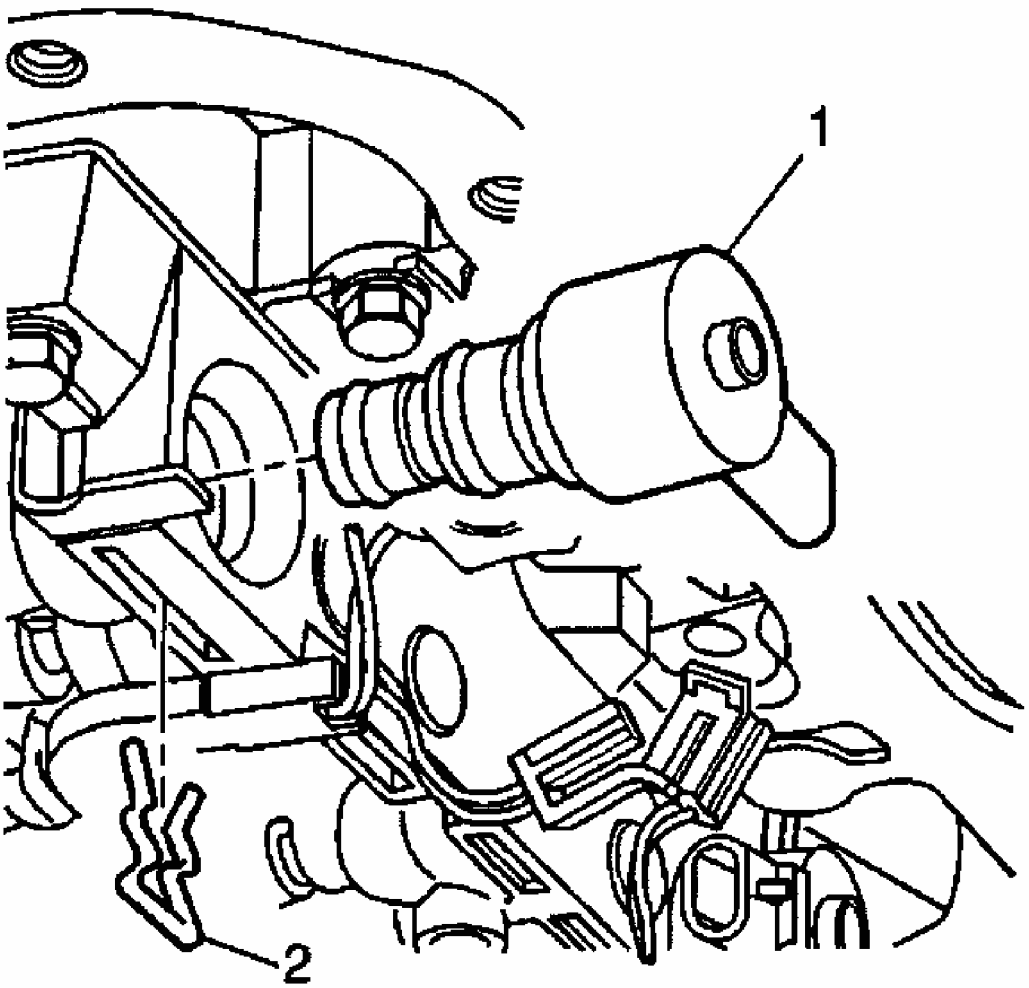

Fig. 50: Removing & Installing TCC PWM Solenoid
Courtesy of GENERAL MOTORS CORP.

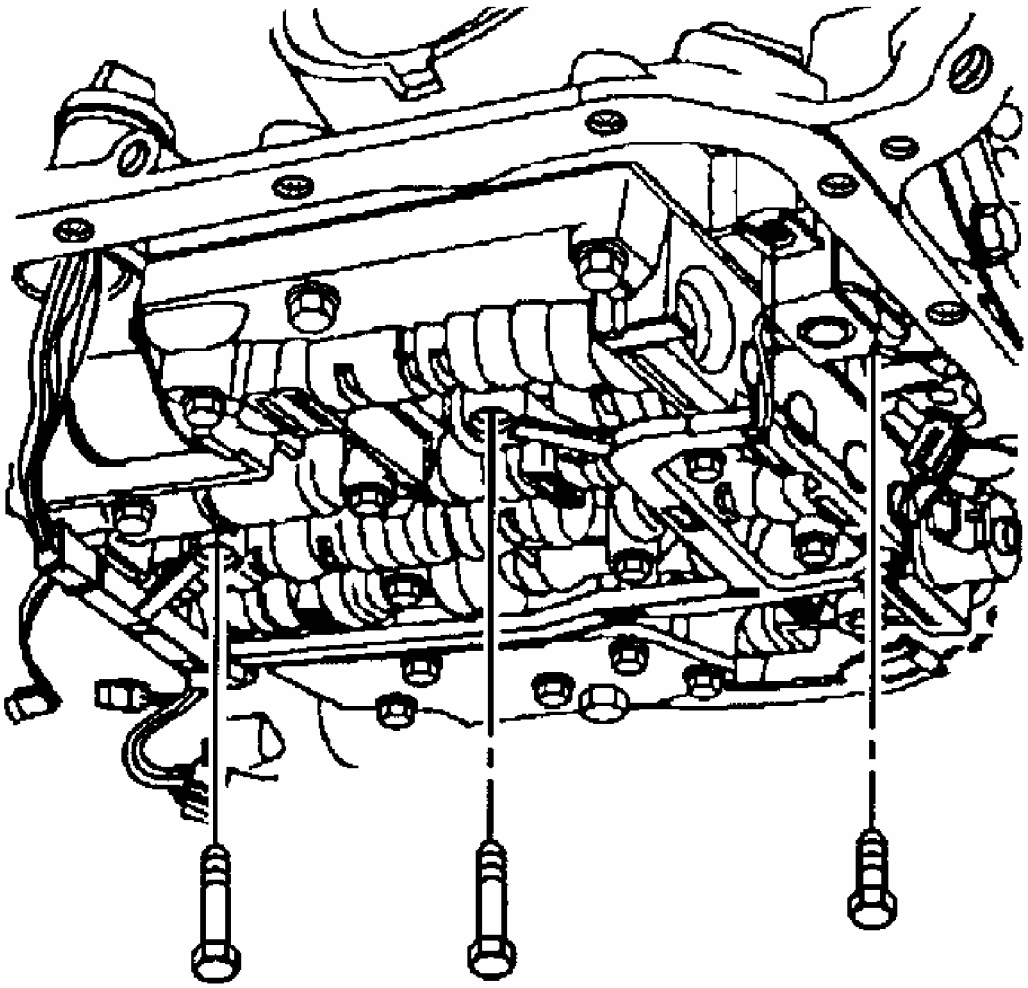

Fig. 51: Removing & Installing Valve Body/TCC Solenoid Bolts
Courtesy of GENERAL MOTORS CORP.

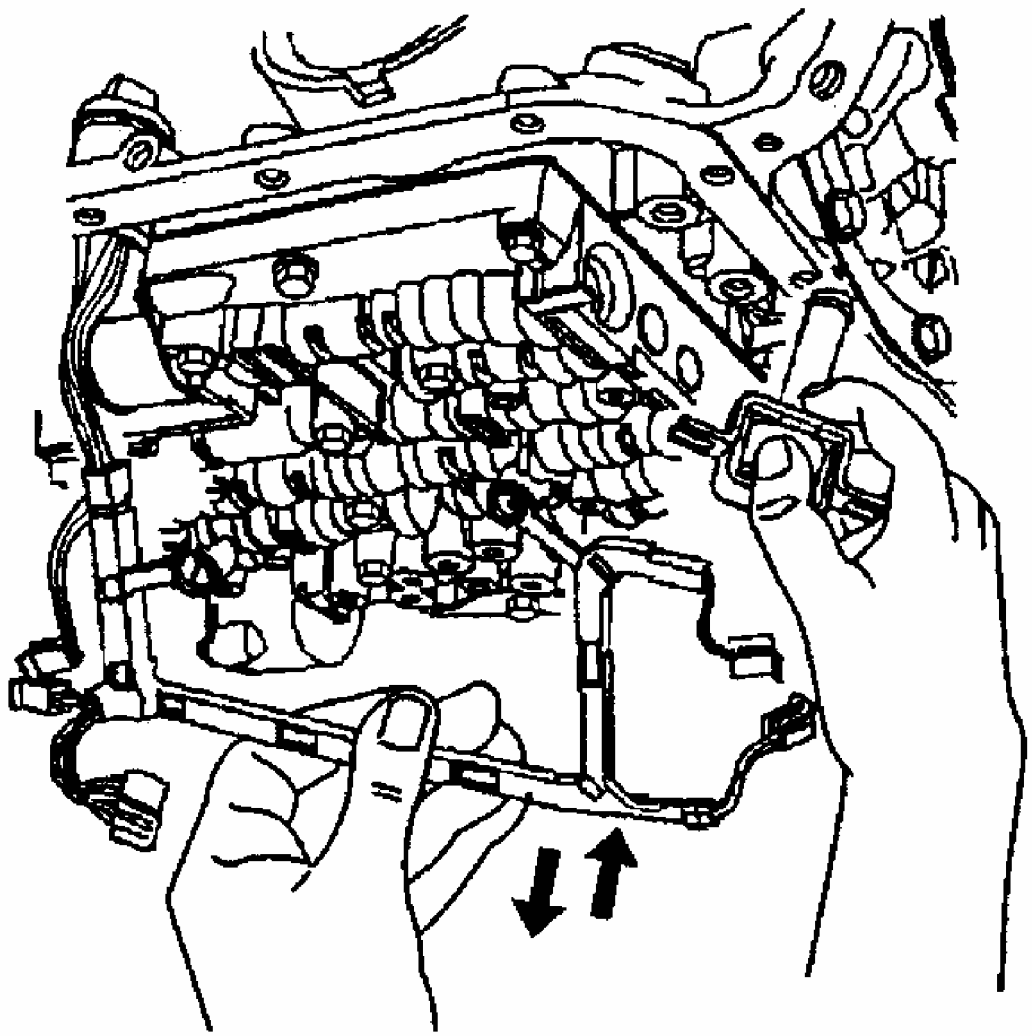

Fig. 52: Removing & Installing Internal Wiring Harness
Courtesy of GENERAL MOTORS CORP.

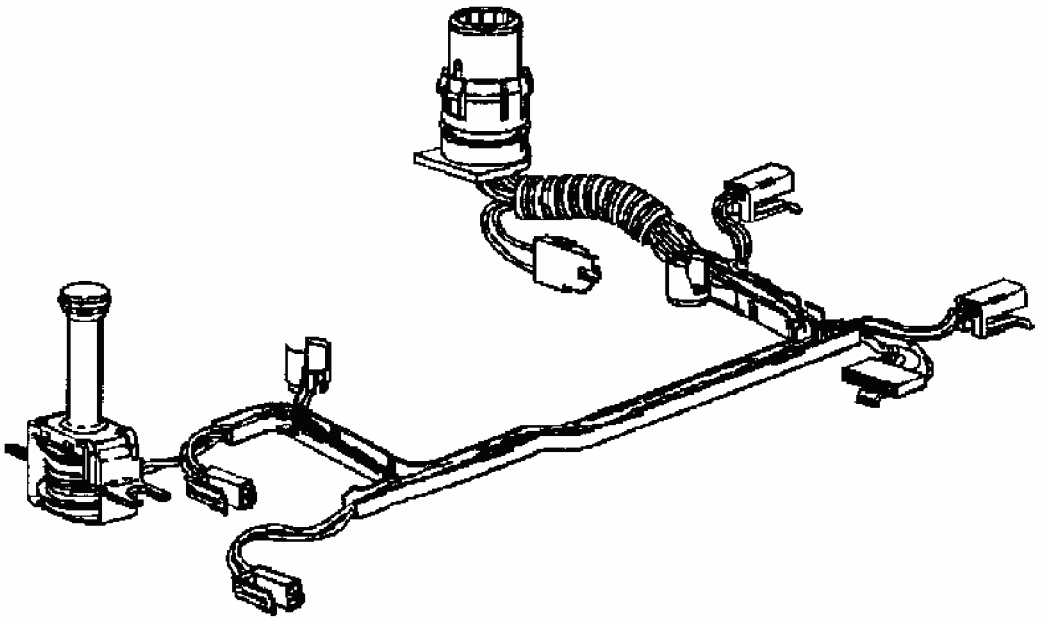

Fig. 53: Inspecting Internal Wiring Harness
Courtesy of GENERAL MOTORS CORP.

VALVE BODY & PRESSURE SWITCH

Removal

1. Ensure that removal of the valve body is necessary before proceeding. The following components can be serviced without removing the valve body from the transmission:
   - Torque converter clutch solenoid (1).
   - Pressure control solenoid (2).
   - Internal wiring harness (3).
   - 2-3 shift solenoid (4).
   - 1-2 shift solenoid (5).
   - Transmission fluid pressure manual valve position switch (6).
   - 3-2 shift solenoid (7).
   - Torque converter clutch pulse width modulation (TCC PWM) solenoid (8).

   See **Fig. 54** .

2. Remove the fluid level indicator. Raise and support the vehicle. Remove the oil pan, gasket and filter. See **DRAINING & REFILLING** under LUBRICATION.

3. Disconnect the internal wiring harness electrical connectors from the following components: transmission fluid pressure manual valve position switch (1), 1-2 shift solenoid (2), 2-3 shift solenoid (3), pressure control solenoid (4), TCC PWM solenoid (5), 3-2 shift solenoid (6) and bracket bolt (2).
4. Remove the fluid indicator stop. See **Fig. 55** . Remove the fluid indicator bracket (1). Remove the TCC PWM solenoid retainer (2) with a small screwdriver. Rotate the solenoid (1) in the bore (if necessary) until the flat part of the retainer (2) is visible.
5. Remove the TCC PWM solenoid (1) to access the TCC solenoid retaining bolts. See **Fig. 50** . Remove the TCC solenoid retaining bolts. See **Fig. 56** . Remove the TCC solenoid (with O-ring seal) and wiring harness from the control valve body.
6. Reposition the harness to the side of the transmission case. See **Fig. 52** . Remove the control valve body bolts which retain the transmission fluid pressure switch to the control valve body. See **Fig. 57** . Remove the transmission fluid pressure switch. Inspect the transmission fluid pressure switch for damage or debris. See **Fig. 58** .
7. Remove the manual detent spring retaining bolt. Remove the manual detent spring. See **Fig. 59** . Inspect the manual detent spring for cracks or damage.

NOTE: Keep the control valve body level when lowering it from the vehicle. This will prevent the loss of checkballs located in the control valve body passages.

8. Remove the remaining control valve body bolts. Carefully begin to lower the control valve body down from the transmission case while simultaneously disconnecting the manual valve link. See **Fig. 60** .
9. If disassembly of the control valve body is necessary, see appropriate OVERHAUL article in AUTOMATIC TRANSMISSIONS.

Installation

1. Install the checkballs (1-7) in the valve body. See **Fig. 61** . Install the control valve body to the transmission case while simultaneously connecting the manual valve link to the manual valve. See **Fig. 60** .

NOTE: When installing bolts throughout this procedure, ensure to use the correct bolt size and length in the correct location as specified.

2. Verify the manual valve link (3) is installed properly to the inside detent lever (1) and the manual valve (2). See **Fig. 62** . Install one bolt (M6 X 1.0 X 47.5) hand-tight in the center (1) of the valve body to hold it in place. See **Fig. 63** . DO NOT install the transmission fluid indicator stop bracket and bolt at this time.
3. Install but do not tighten the control valve body bolts which retain only the valve body directly. See **Fig. 64** .

4. Each numbered bolt location corresponds to a specific bolt size and length, as indicated by the following:
   - M6 X 1.0 X 65.0 (1).
   - M6 X 1.0 X 54.4 (2).
   - M6 X 1.0 X 47.5 (3).
   - M6 X 1.0 X 35.0 (4).
   - M8 X 1.0 X 20.0 (5).
   - M6 X 1.0 X 12.0 (6).
   - M6 X 1.0 X 18.0 (7).
5. Install the manual detent spring. Install but do not tighten the manual detent spring retaining bolt. See **Fig. 59** . Install the transmission fluid pressure switch. See **Fig. 57** . Install but do not tighten the control valve body bolts which retain the transmission fluid pressure switch to the control valve body. See **Fig. 57** .
6. Tighten the control valve body bolts in a spiral pattern starting from the center, as indicated by the arrows. Tighten the control valve body bolts (in sequence) to 97 INCH lbs. (11 N.m). See **Fig. 64** .
7. Ensure the manual detent spring is aligned properly with the detent lever. Tighten the manual detent spring bolt to specification. See **TORQUE SPECIFICATIONS** .
8. Install the TCC solenoid with a NEW O-ring seal to the valve body. Install the TCC solenoid bolts. Tighten the TCC solenoid retaining bolts to specification. See **TORQUE SPECIFICATIONS** .
9. Install the internal wiring harness to the valve body. The internal wiring harness has a tab (1) on the edge of the conduit. Place the tab between the valve body and the pressure switch in the location shown (2). See **Fig. 52** . Press the harness into position on the valve body bolt bosses (1, 3).
10. Install the TCC PWM solenoid (1) to the control valve body. Install the TCC PWM solenoid retainer (2). See **Fig. 50** .
11. Install the transmission fluid indicator stop bracket (1) and bolt (2). See **Fig. 55** . Tighten the transmission fluid indicator stop bracket bolt to specification. See **TORQUE SPECIFICATIONS** .
12. Connect the internal wiring harness electrical connectors to the following components:
    - Transmission fluid pressure manual valve position switch (1). See **Fig. 20** .
    - 1-2 shift solenoid (2).
    - 2-3 shift solenoid (3).
    - Pressure control solenoid (4).
    - TCC PWM solenoid (5).
    - 3-2 shift solenoid (6).
13. Install the transmission oil pan and filter. See **DRAINING & REFILLING** under

LUBRICATION. Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

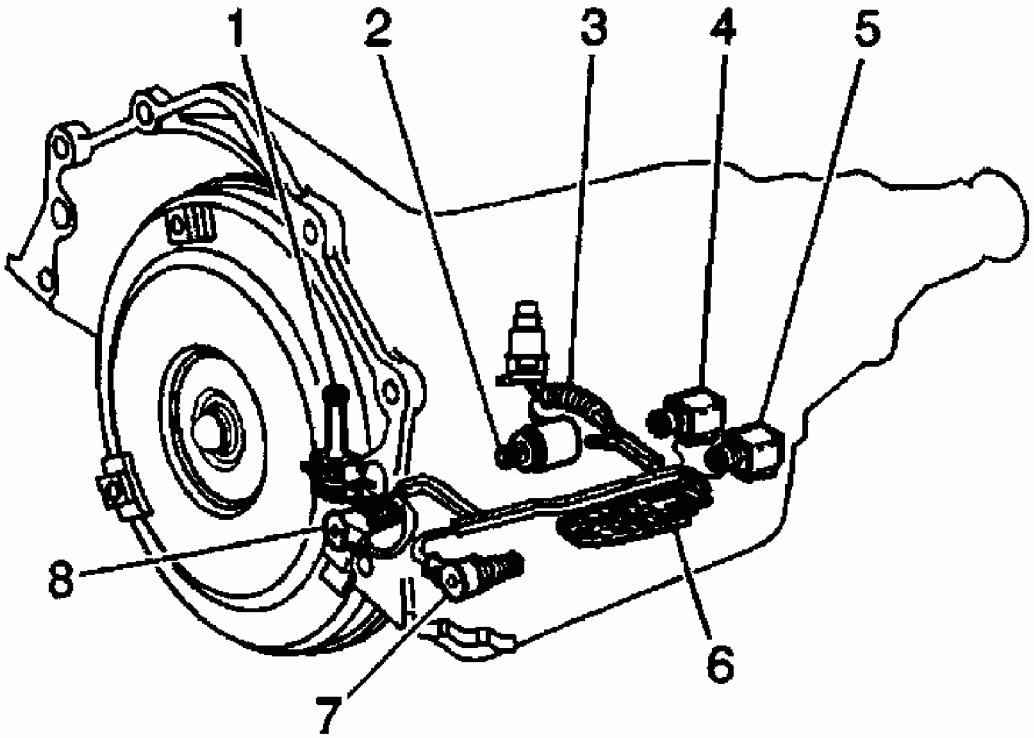

Fig. 54: Internal View Of Serviceable Components
Courtesy of GENERAL MOTORS CORP.

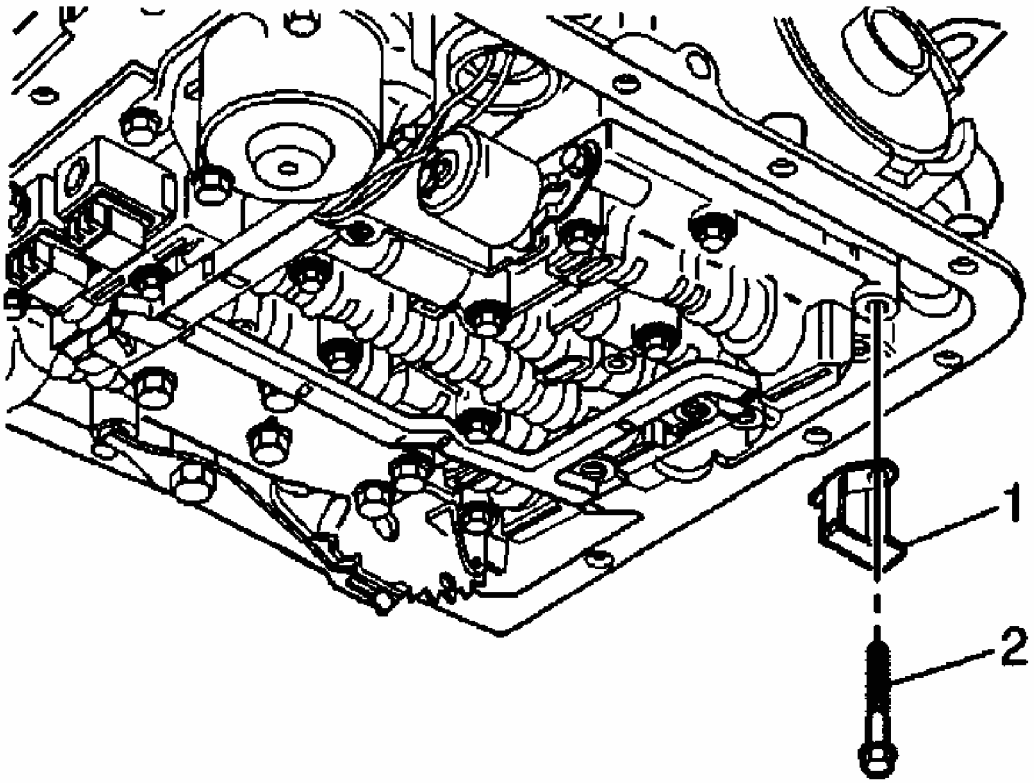

Fig. 55: Removing & Installing Fluid Indicator Stop
Courtesy of GENERAL MOTORS CORP.

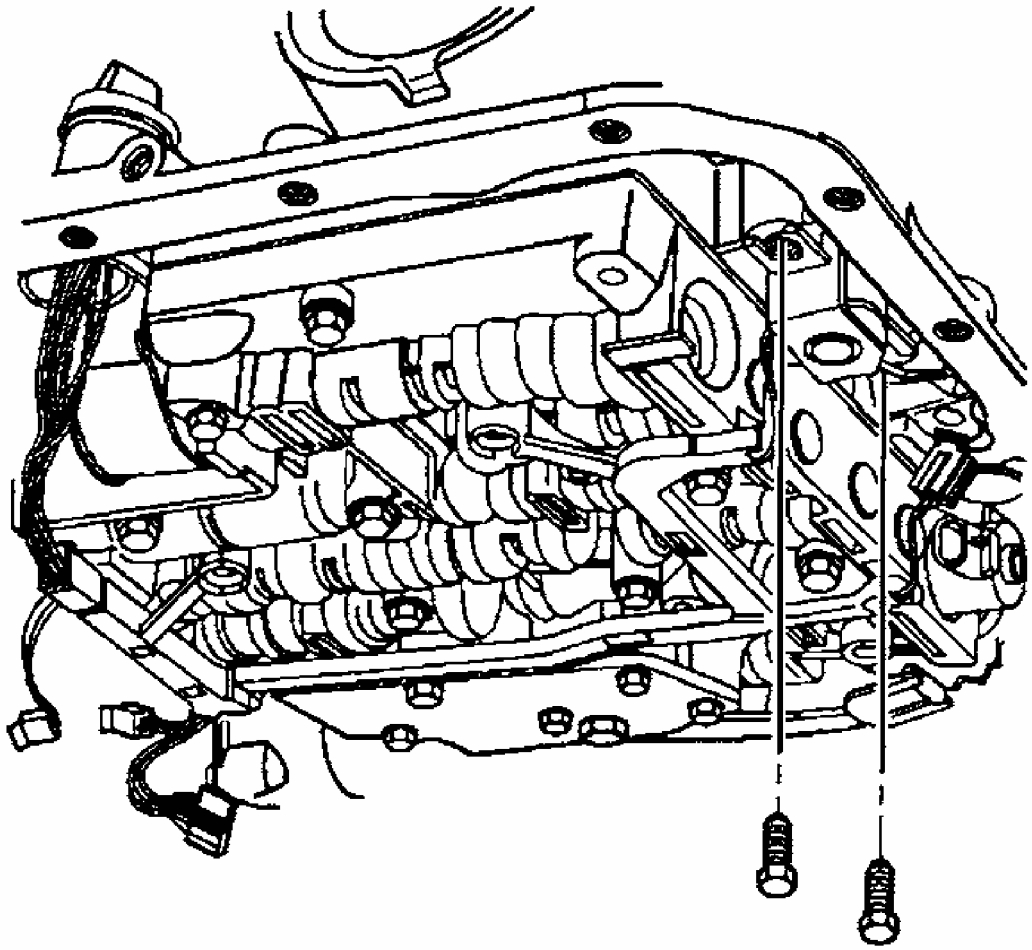

Fig. 56: Removing & Installing TCC Retainer Bolts
Courtesy of GENERAL MOTORS CORP.

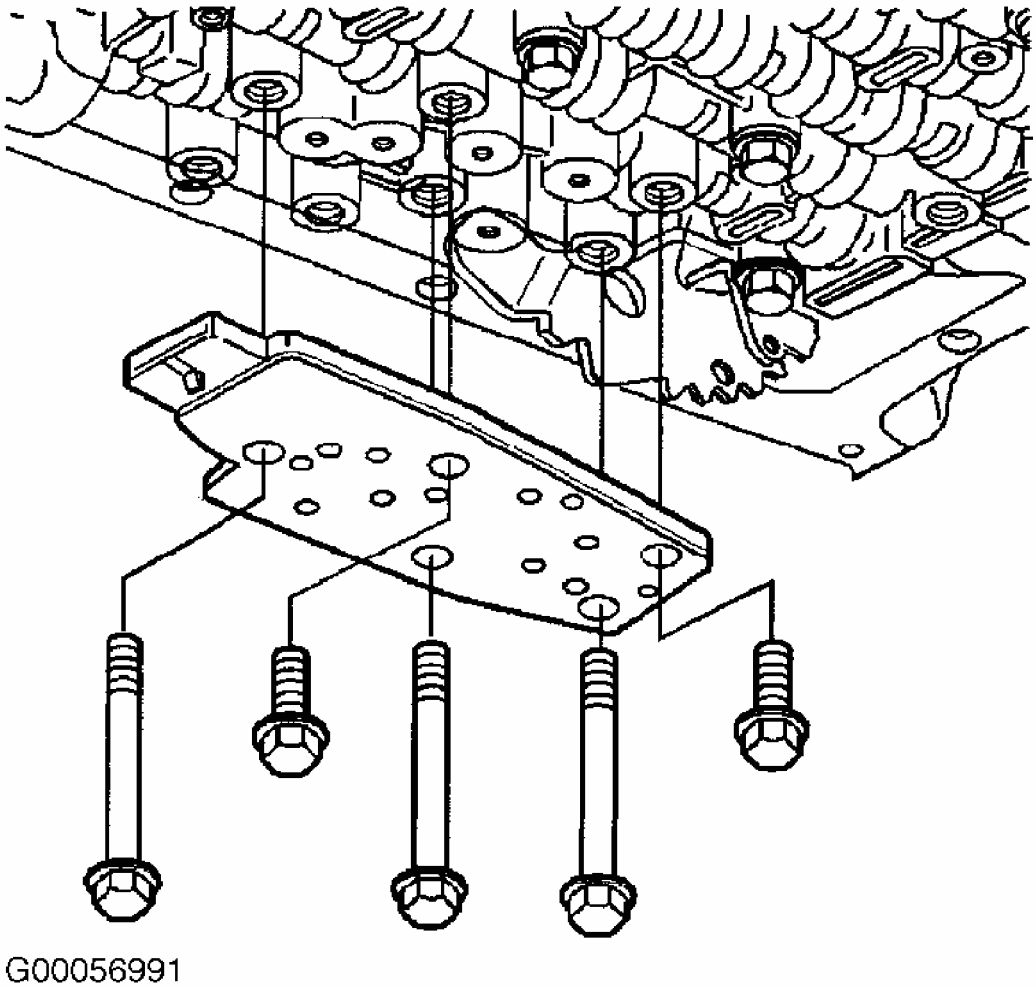

Fig. 57: Removing & Installing Fluid Pressure Switch Bolts
Courtesy of GENERAL MOTORS CORP.

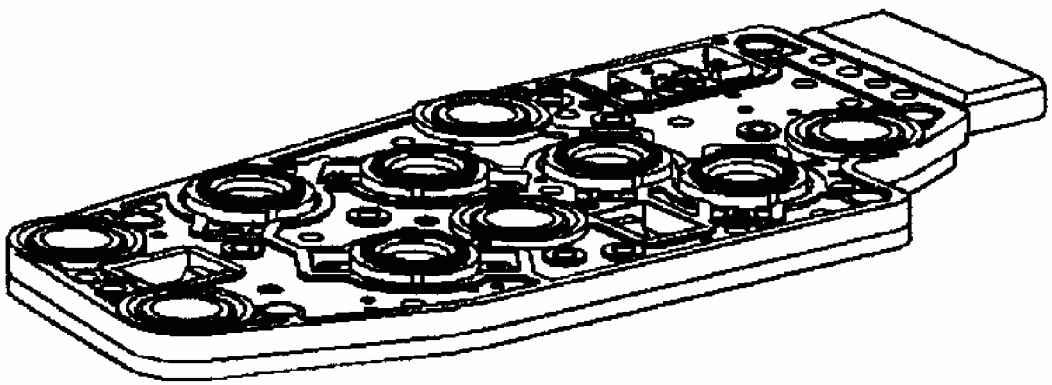

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Fig. 58: Inspecting Fluid Pressure Switch For Damage
Courtesy of GENERAL MOTORS CORP.

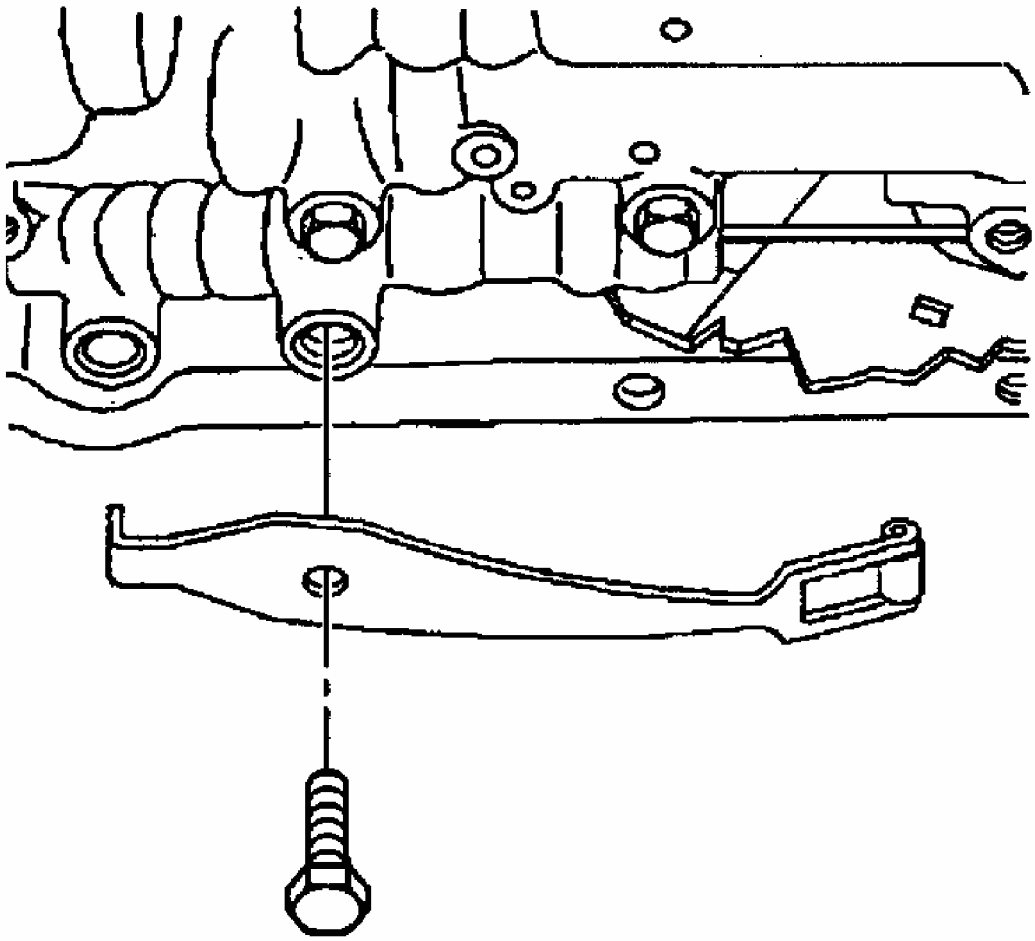

Fig. 59: Removing & Installing Manual Detent Lever
Courtesy of GENERAL MOTORS CORP.

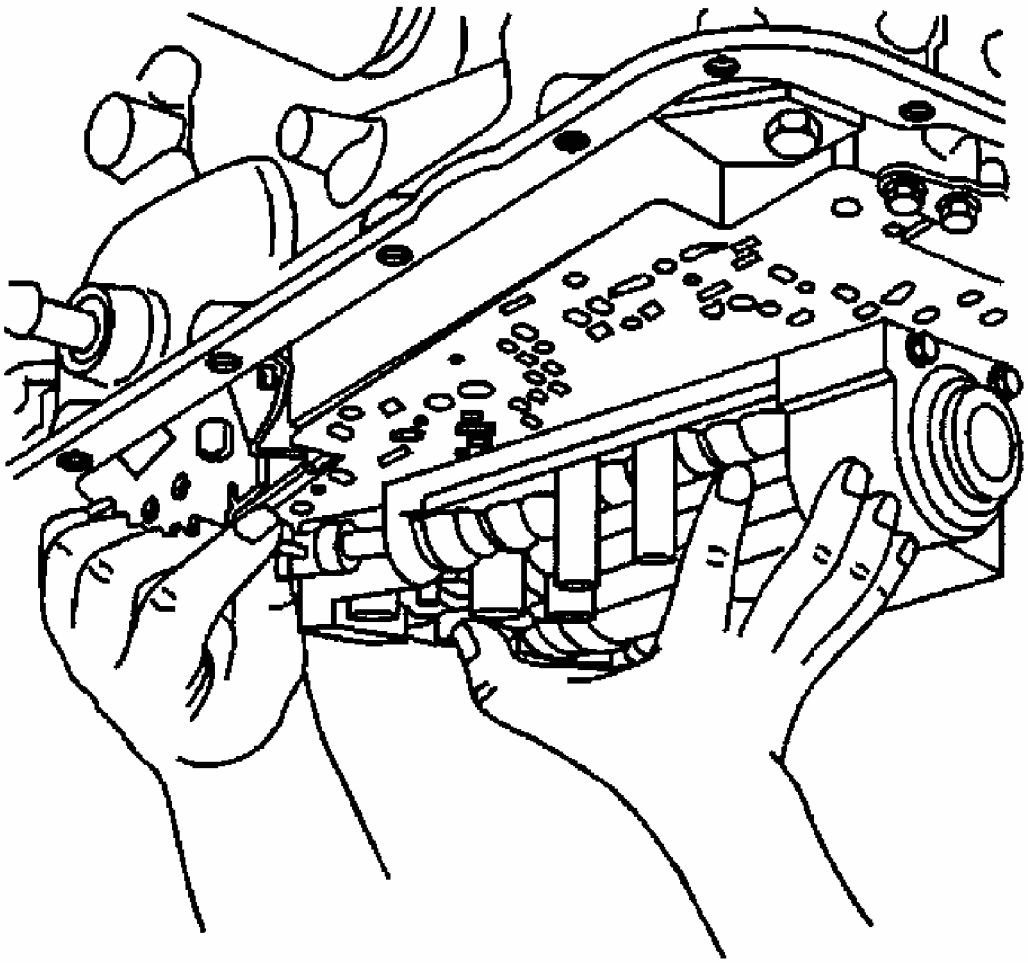

Fig. 60: Lowering & Raising Valve Body
Courtesy of GENERAL MOTORS CORP.

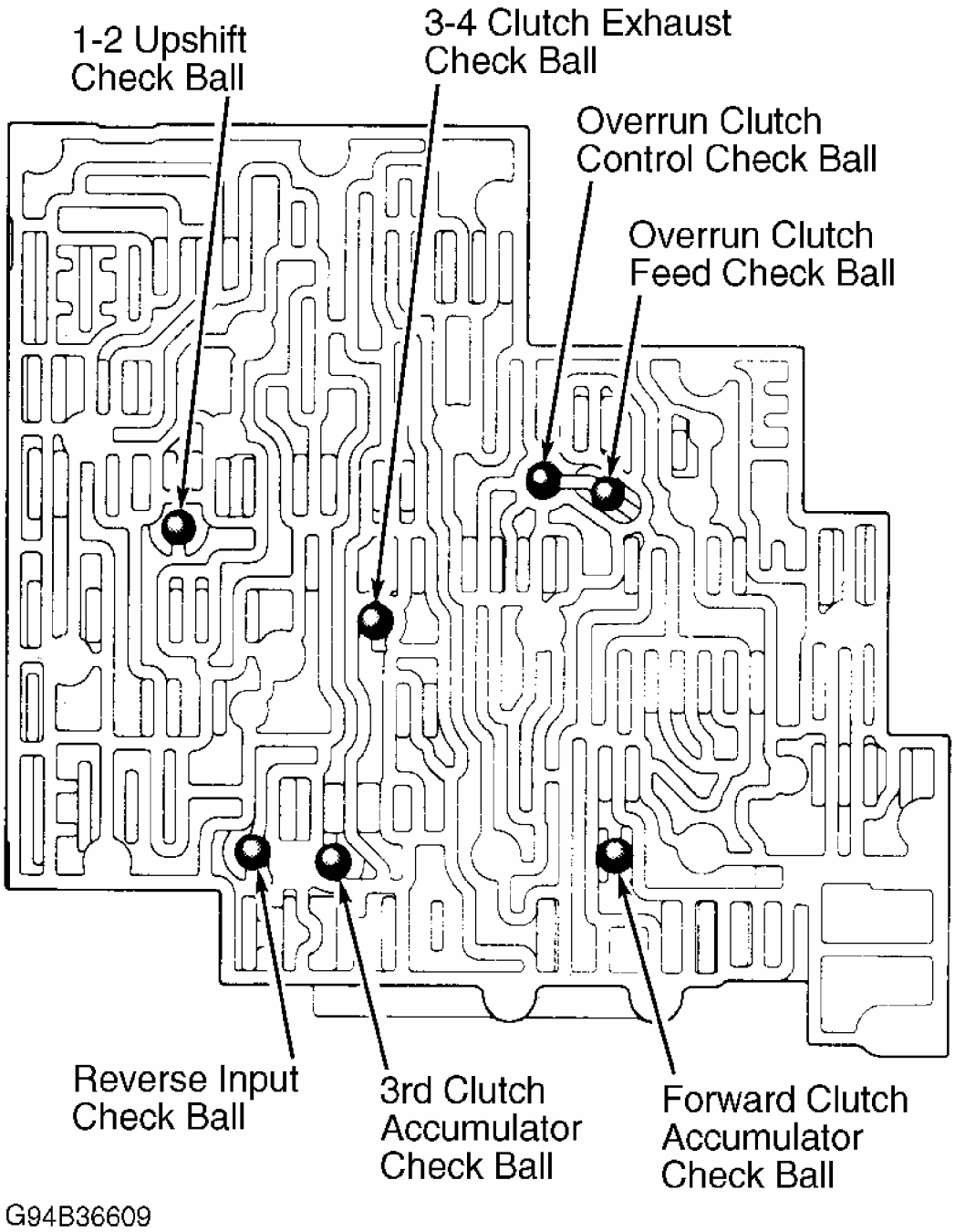

Fig. 61: Installing Check Balls In Valve Body
Courtesy of GENERAL MOTORS CORP.

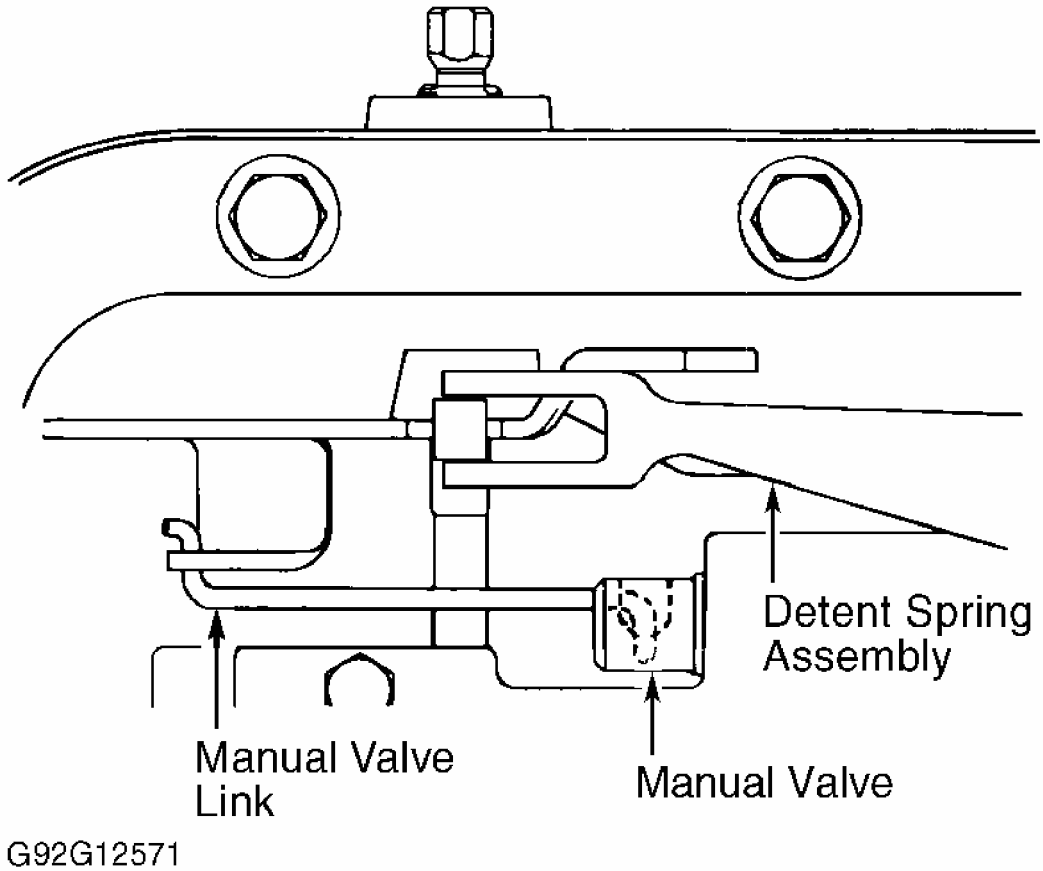

Fig. 62: Installing Manual Valve To Detent Lever
Courtesy of GENERAL MOTORS CORP.

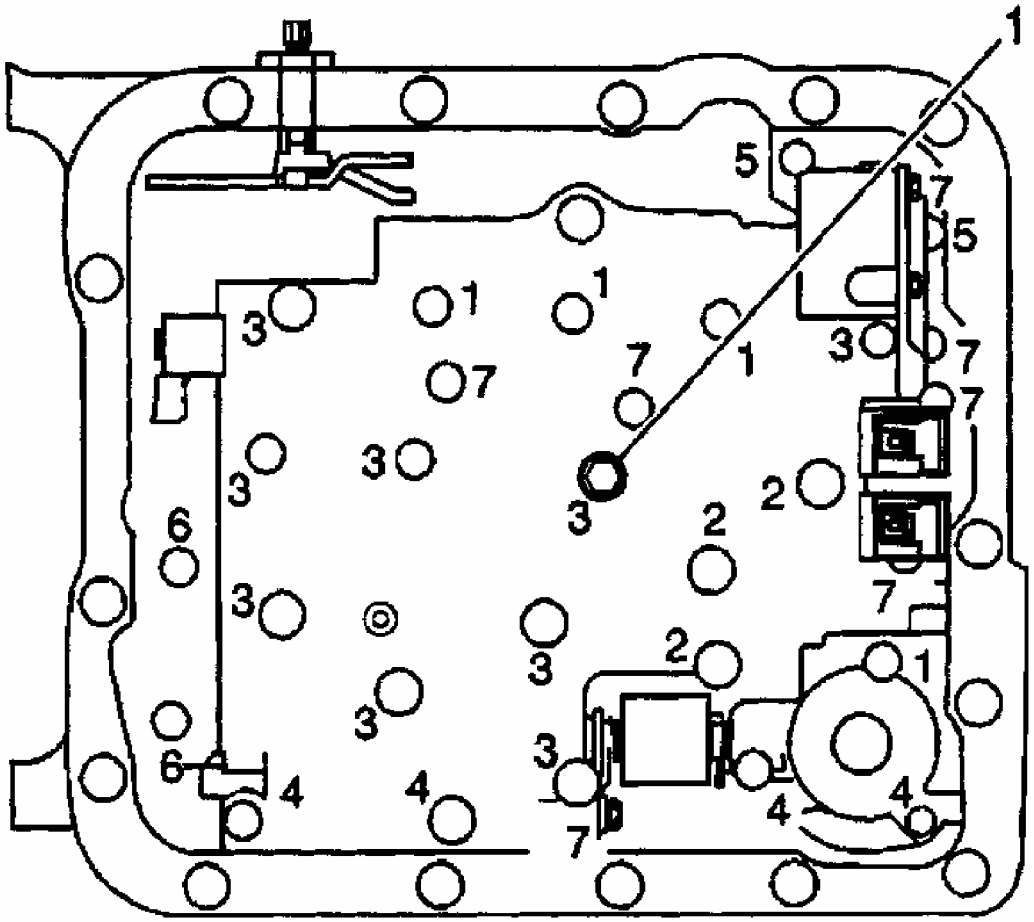

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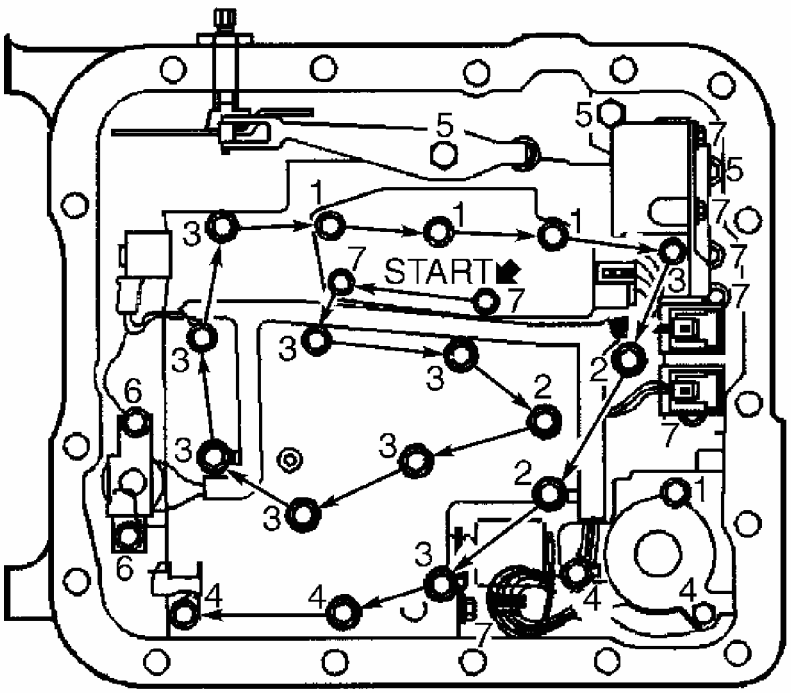
Fig. 63: Location Of 1st Bolt To Hold Valve Body In Place
Courtesy of GENERAL MOTORS CORP.



NOTE: Numbers identify bolt length.
Arrows identify tightening sequence.

VALVE BODY BOLT IDENTIFICATION

Bolt No.	Length In. (mm)
1	2.56 (65)
2	2.14 (54.4)
3	1.87 (47.5)
4	1.38 (35)
5	.79 (20)
6	.47 (12)
7	.71 (18)

G99C03603

Fig. 64: Valve Body Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

VEHICLE SPEED SENSOR

Removal

Raise the vehicle. Remove the harness connector. Remove the bolt. Place a drain pan under the vehicle. Remove the vehicle speed sensor. See **Fig. 65** . Remove the O-ring seal.

Installation

Install the new speed sensor and O-ring seal. See **Fig. 65** . Coat the seal with a thin film of ATF. Install and tighten the bolt to specification. See **TORQUE SPECIFICATIONS** . Install the harness connector. Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

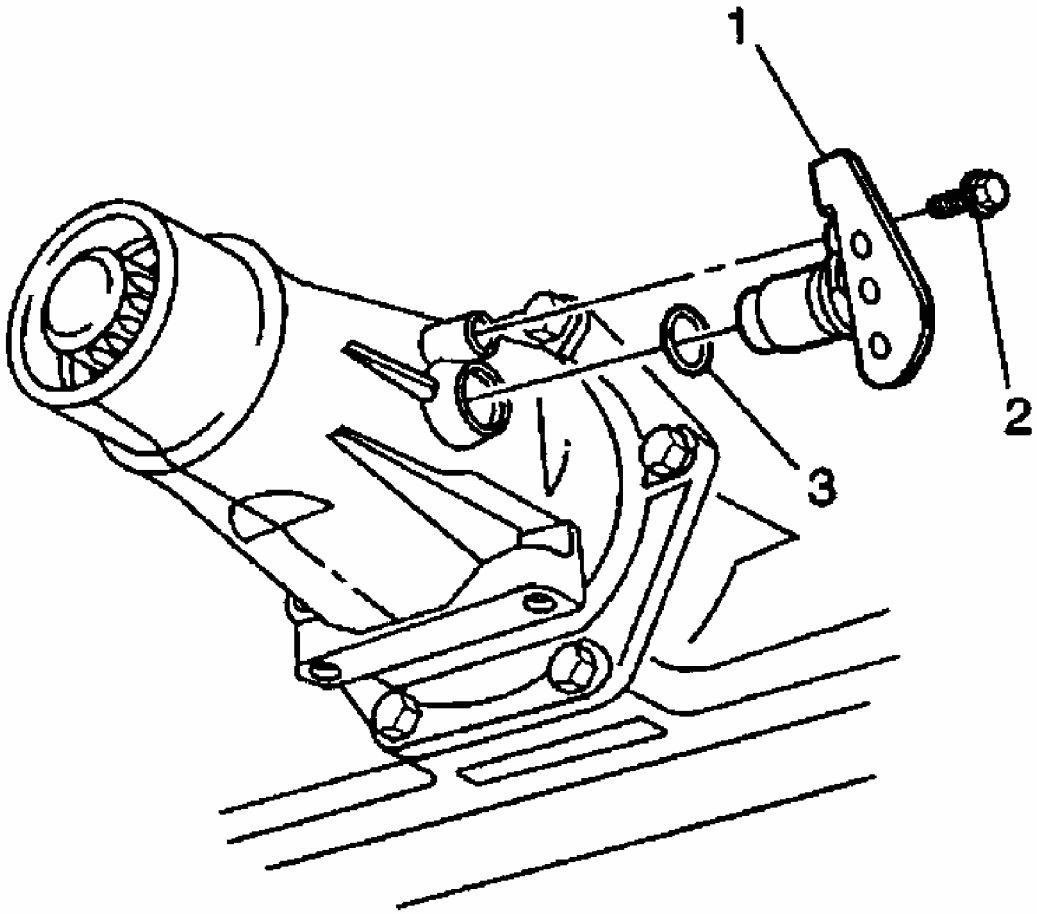


Fig. 65: Removing & Installing VSS
Courtesy of GENERAL MOTORS CORP.

2-4 SERVO

NOTE: Tools required: Servo Cover Compressor (J-29714-A).

Removal

1. Raise and support the vehicle. Remove the oil pan bolt below and to the left of the 2-4

servo cover. Install servo cover compressor to the oil pan rail. Tighten the bolt on the servo cover compressor to compress the servo cover. See **Fig. 66** .

2. Remove the servo cover retaining ring. See **Fig. 67** . Loosen the bolt on the servo cover compressor to release tension on the servo cover. Remove the servo cover and O-ring seal. If the cover is hung up on the seal, use a pick (2) to pull and stretch the seal (1) out of the groove. Cut and remove the O-ring seal before removing the cover. See **Fig. 68** .
3. Remove the 2-4 servo assembly from the transmission.
4. Inspect the 4th apply piston, the 2-4 servo converter, 2nd apply piston, and the piston inner housing for cracks, scoring, burrs and nicks. See **Fig. 69** .

Installation

1. Install the new seals on the pistons and the servo cover. Lubricate the seals with clean ATF. Install the 2-4 servo assembly into the 2-4 servo bore. Install the servo cover and O-ring seal. Install the servo cover compressor.
2. Tighten the bolt on the servo cover compressor to compress the servo cover. See **Fig. 66** . Install the servo cover retaining ring. Remove the servo cover compressor from the oil pan flange.
3. Install the oil pan bolt. Tighten the oil pan bolt to specification. See **TORQUE SPECIFICATIONS** . Lower the vehicle. Fill transmission with appropriate fluid to proper level. See **LUBRICATION** .

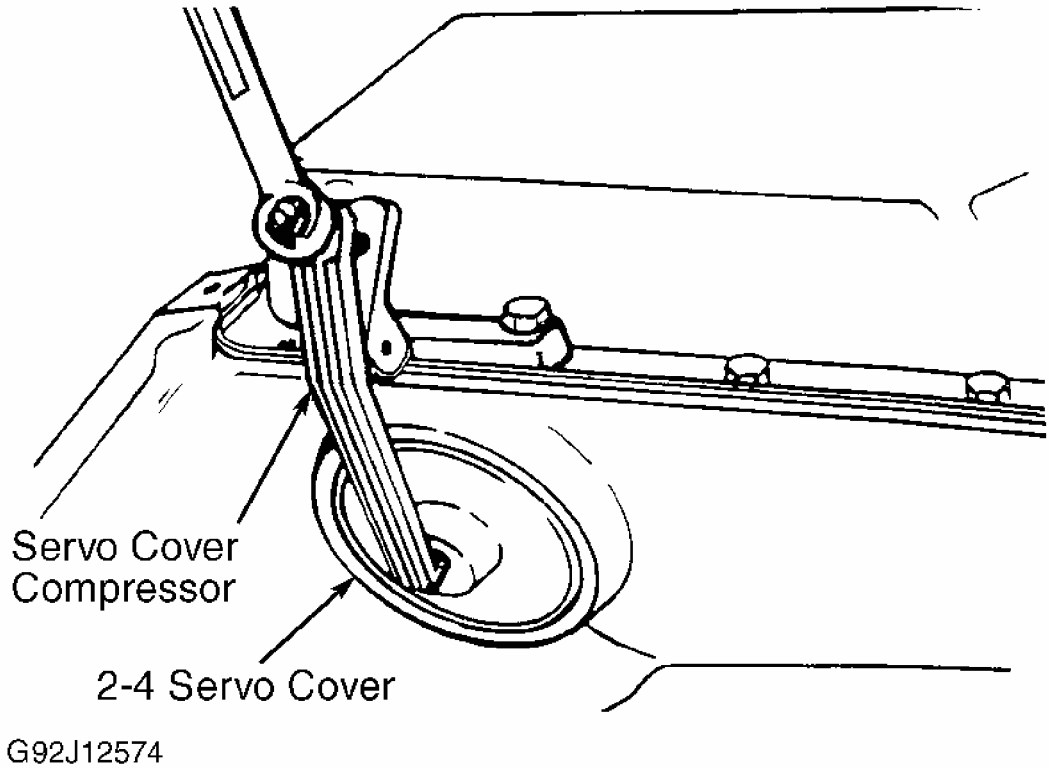


Fig. 66: Installing Servo Cover Compressor
Courtesy of GENERAL MOTORS CORP.

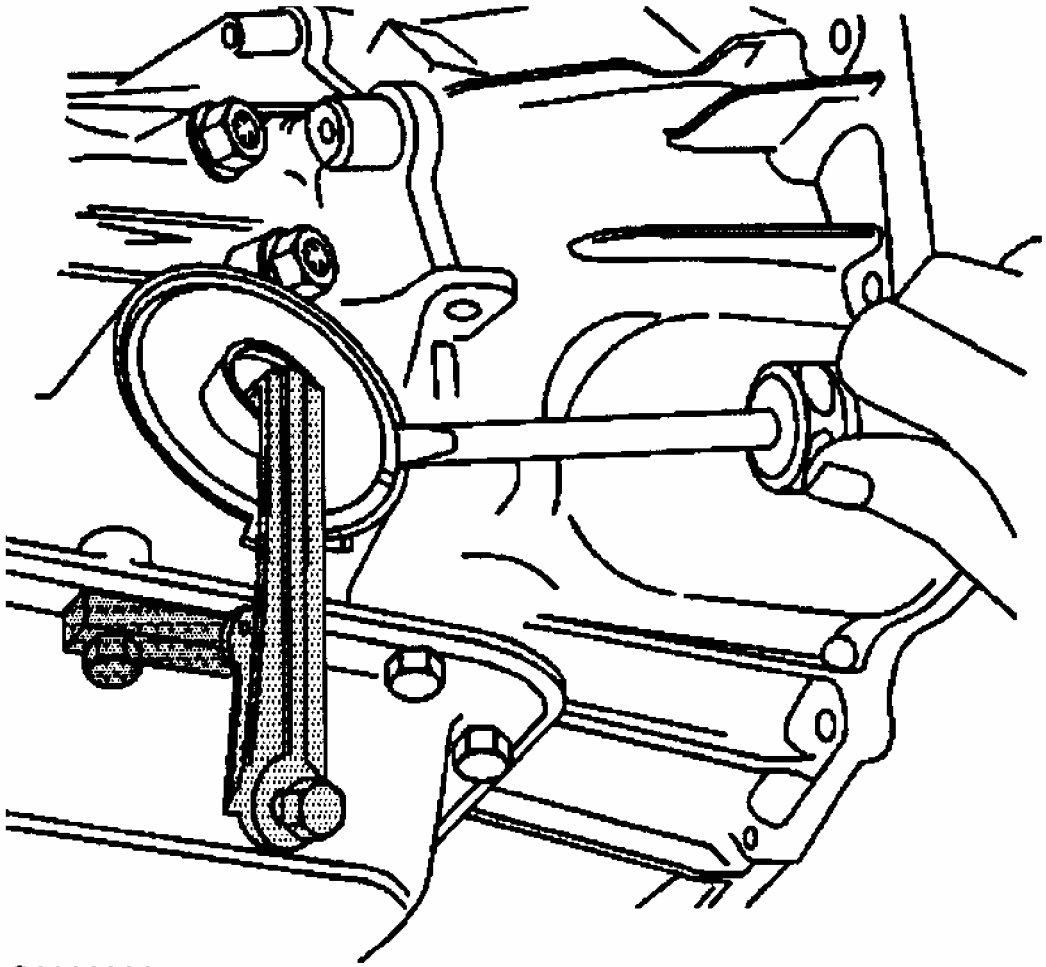


Fig. 67: Removing Servo Cover Retaining Ring
Courtesy of GENERAL MOTORS CORP.

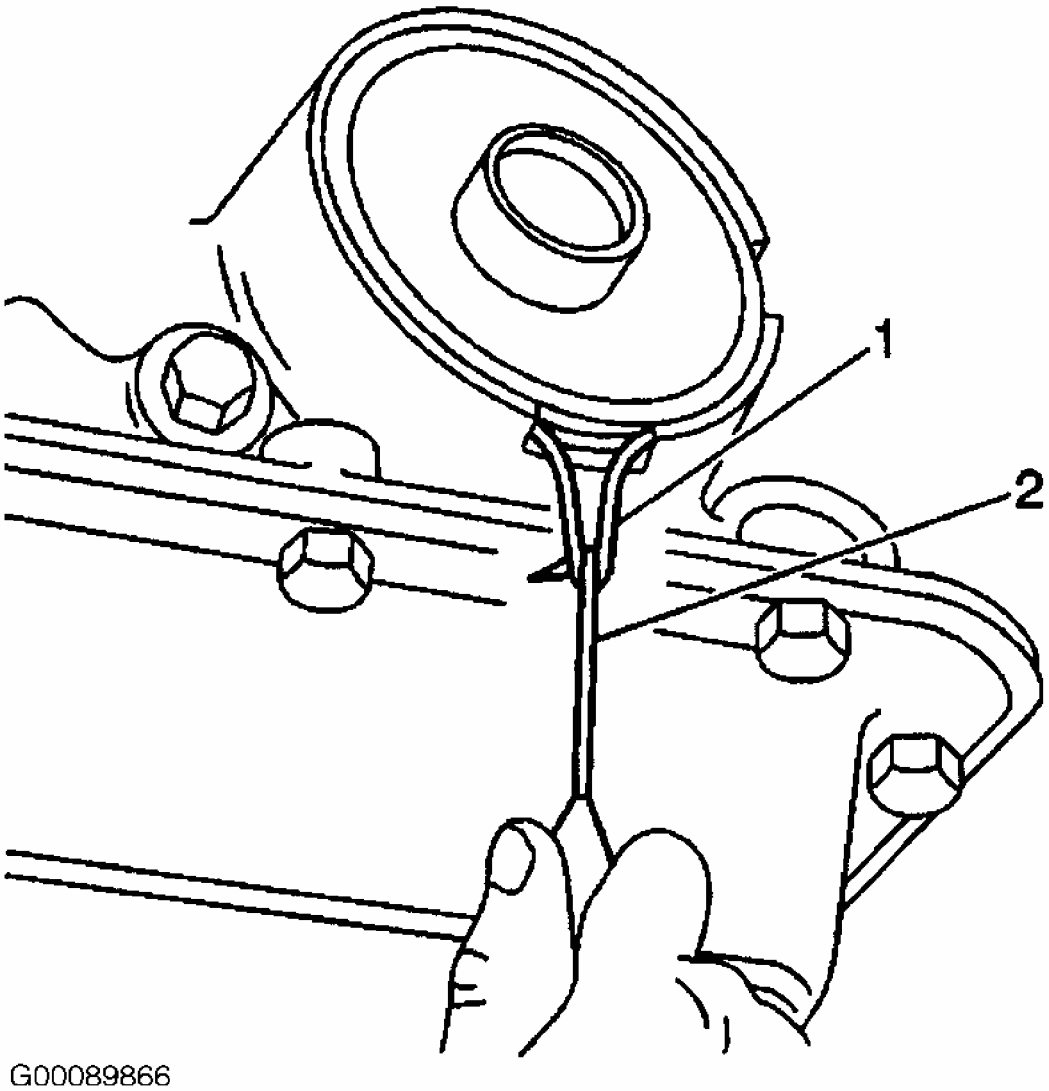


Fig. 68: Removing Servo O-Ring
Courtesy of GENERAL MOTORS CORP.

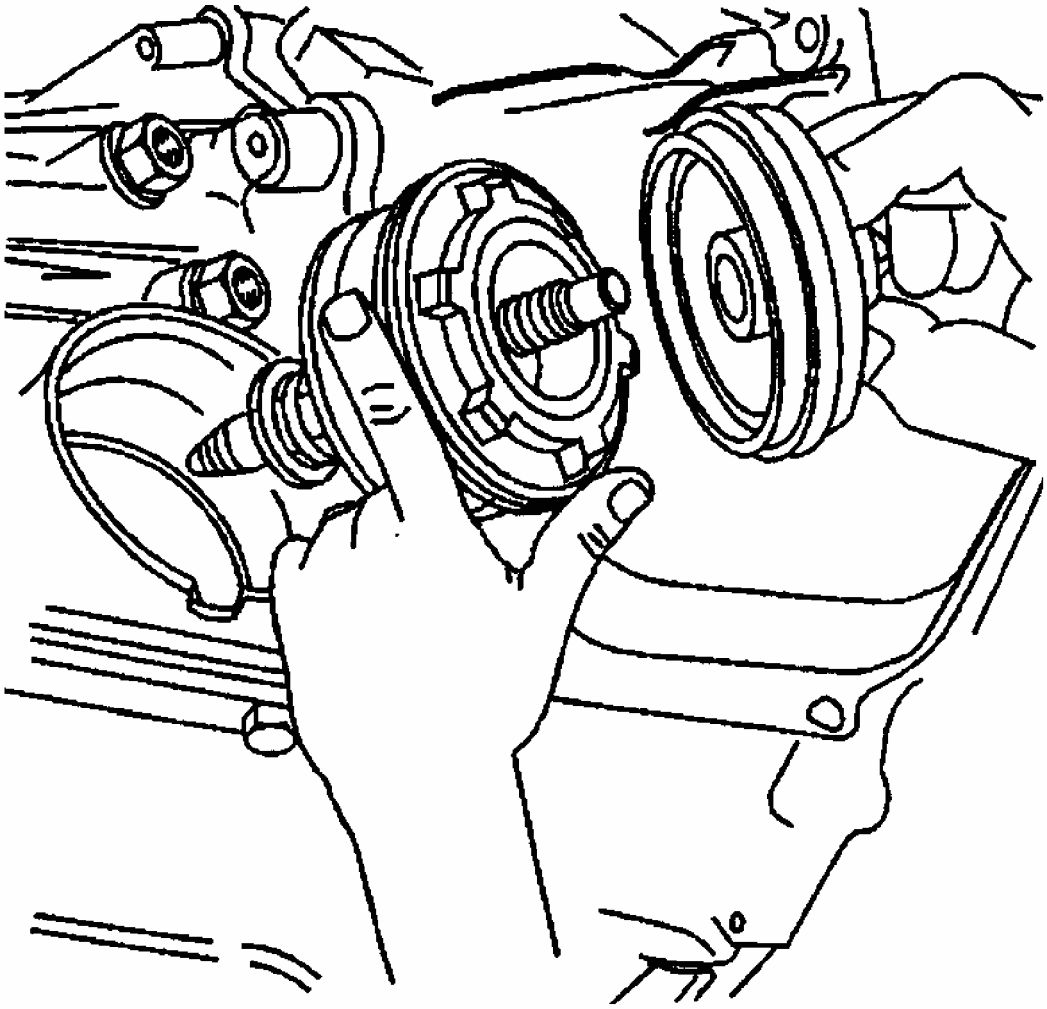


Fig. 69: Inspecting Servo Components For Damage
Courtesy of GENERAL MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Filler Tube Bolt	35 (47)
Oil Pan Drain Plug	13 (18)
PNP Switch Bolt	18 (24)
Transmission Control Lever Nut	18 (24)
	INCH Lbs. (N.m)
Accumulator-To-Case Bolt	97 (11)

Manual Detent Spring Bolt	97 (11)
Oil Cooler Line Bolt	97 (11)
Oil Pan Bolt	97 (11)
Oil Pass Cover Bolt	97 (11)
Pressure Control Solenoid Bolt	97 (11)
TCC Solenoid Bolt	97 (11)
Transmission Fluid Indicator Stop Bolt	97 (11)
Valve Body-To-Case Bolt (1)	97 (11)
VSS Bolt	97 (11)
(1) Tighten valve body bolts in a spiral pattern starting in center of valve body.	